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HARLAN P. FRENCH

81 Chapel Street ALBANY, N. Y.

School Board Journal

Founded 1890 by WILLIAM GEORGE BRUCE

VOL. XXXVIII, No. 4 — MILWAUKEE—New York—Chicago, APRIL, 1909 — SUBSCRIPTION PRICE $1.00 PER YEAR

THE PROBLEM PRECEDING THE SCHOOLHOUSE.

School Boards perennially experience difficulty in securing suitable sites for school buildings.

School Districts.

Under the express provisions of Burns' Ann. St. of 1908 (Nos. 6404, 6405), a "school township" is a corporation, and has control of the schools, schoolhouses and school funds. It is a distinct legal entity from that of the civil township. Teeple vs. State, Ind. 1908.

An irregular order by the county superintendent for a change of boundaries of a school district, affirmed on appeal by the county commissioners, is final, and not subject to collateral attack in an action for an injunction. School Dist. No. 116 vs. Wolf, Kan. 1908.

Although the statute contemplates filing a petition with the county superintendent for change of boundaries of a school district before notice setting a time for the hearing as to the change, yet, where a verbal request is made and notice given and the interested parties appear, and appeal is taken from an order to the county commissioners, and the order is affirmed, the proceeding is not void, but only irregular. School Dist. No. 116 vs. Wolf, Kan. 1908.

On the detachment of the territory within which a school district officer resides from the school district of which he is an officer, his office immediately becomes vacant, and may be filled by appointment. School Dist. No. 116 vs. Wolf, Kan. 1908.

Under Burns' Ann. St. 1908, Nos. 6449-6453, providing for the transfer of children from one school corporation to another, the parent, guardian or custodian of a transferred child is not a legal voter of the district to which the pupil is transferred. Teeple vs. State, Ind. 1908.

Where complainants and all other taxpayers of a school district had known that the officers of the district had maintained a sectarian school, in the violation of state constitution (Art. 10, No. 3), and that the electors of the district each year had been informed that the school taxes had been spent for that purpose, and without protest at each meeting like expenditures were directed for the ensuing year, the officers of the district were entitled to believe that the money had been expended in accordance with the wishes of the district, so that complainants were not entitled after twenty years to compel officers to reimburse the district for the moneys illegally expended. Dorner vs. School District No. 5, Wis. 1908.

School Buildings.

The Revisal of 1905 (No. 4129), providing that the county board of education shall establish no new school in any township within less than three miles of some school already established in said township, does not prohibit the board from repairing or building a new house on the site where a school has long been established. Pickler vs. Board of Education of Davie County, N. C. 1908.

The rebuilding of a schoolhouse and the changing of school site are matters vested by the statute in the sound discretion of the school committee, and will not be interfered with by the courts unless there is a violation of law, or unless the committee was influenced by improper motives, or there was misconduct on their part. Venable vs. School Committee of Pilot Mountain, N. C. 1908.

The fact that the brothers of two of the school committee contributed to the purchase of a new school site does not *per se* invalidate the action of the board changing the site, in the absence of any evidence that they influenced any member thereof. Venable vs. School Committee of Pilot Mountain, N. C. 1908.

Wisconsin statutes of 1898, No. 430, authorizes the officers of a school district to rent or build a schoolhouse in which the district is required to maintain a common school by Section 423, and also authorizes the district to vote a tax to hire a schoolhouse. *Held,* that where a schoolhouse owned by a district was inadequate, the district had power to rent a part of a parochial school building within the district in which to maintain a common school. Dorner vs. School District No. 5, Wis. 1908.

Under Public School Act of October 19, 1903 (P. L. p. 5), a board of education has the power to build a central heating plant, from which heat is to be distributed through pipes to a group of schoolhouses in the vicinity of, but not adjoining, said plant. Scola vs. Board of Education of Town of Montclair, N. J. Sup. 1908.

Public School Act of October 19, 1903 (P. L. p. 5), requires that there shall be advertisements for proposals for the building, enlargement or repair of schoolhouses, and that no bid shall be accepted which does not conform to the specifications therefor. *Held,* that after the reception of bids, the board of education could not modify the specification by changes, and award a contract to a former bidder, though the lowest, to execute the work according to the revised specifications, at a price less than the original bid. Scola vs. Board of Education of Town of Montclair, N. J. Sup. 1908.

School Taxes.

Where a tax levied by a school district was illegal because in excess of 20 cents on $100 of taxable values, bonds proposed to be issued upon such illegal levy will be enjoined. Rehearing denied. Snyder vs. Baird Independent School Dist., Tex. 1908.

Parents and Teachers.

Under the laws of 1901 (p. 1774, c. 718, Revised Amended Greater New York Charter, No. 1089), providing that at the close of the third year of continuous successful service of a teacher the city superintendent may make a temporary license permanent, the issuance of a special license to a teacher who has served three years under a temporary license is not a determination by the superintendent that the teacher is entitled to a permanent license. Order (1905) 94 N. Y. S. 61, 106 App. Div. 101, affirmed. People vs. Board of Education of City of New York, N. Y. 1908.

Under Burns' Ann. St. 1908 (Nos. 6440-6453), providing for the transfer of children from one school corporation to another, a child of school age, and not the parent, guardian or custodian of such child, is transferred for educational purposes. Teeple vs. State, Ind. 1908.

RULES AND REGULATIONS.

New Bedford, Mass. The school committee has amended its salary rules to provide that all janitors who are absent from duty on account of personal illness or emergency shall be paid the difference between their salary and the salary of the substitute provided, for one week. If absent for any other causes than personal illness or emergency, they shall receive no salary unless by vote of the board.

Lead, S. D. The school board has adopted a rule that teachers lose no pay for absence not exceeding fifteen days caused by sickness.

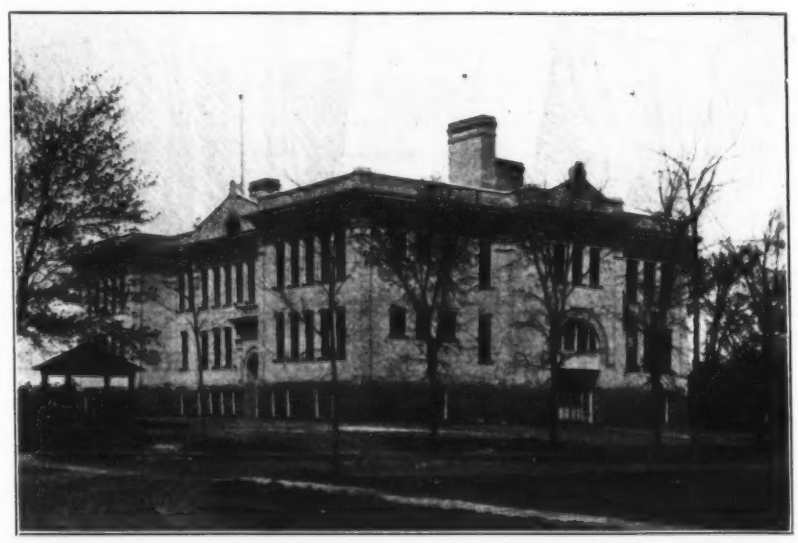
Portsmouth, O. The rules of the board provide for four committees, one each on finance, teacher, buildings and judiciary.

Chicago, Ill. The board of education requires a cash deposit with every bid for books and supplies. A bond is exacted for the faithful performance of all contracts. A new rule of the board touching upon the matter reads:

"No proposals for any purpose shall be considered unless accompanied by the proper deposits required. Upon the acceptance of any proposal, the board, or the committee calling therefor, shall have the right to secure from the party or parties who made the proposal a reasonable and satisfactory bond to secure the faithful compliance with the terms of the proposal and full performance thereof. If the proposal is for $5,000.00 or over, said bond must be an approved surety company bond, the cost of the same to be paid by the contractor."

Richmond, Va. The state board of education has promulgated a ruling by which all the high schools of the state to which state aid is given shall retain and continue the grammar schools during the term for which said high school may be in actual session. In other words, the high schools are not to be operated at the expense of the grammar schools in any part of the state.

NEW HIGH SCHOOL, NORTH YAKIMA, WASH.
Newton C. Gauntt, Architect.



NEW HIGH SCHOOL, NEW LISBON, WIS.
Chandler & Park, Racine, Architects.

Schoolhouse Accommodations

By WILLIAM ESTABROOK CHANCELLOR

In the two years, 1906 and 1907, a commission directly appointed by Congress, and consisting of the superintendent of schools of the District of Columbia, the engineer commissioner of the District and the supervising architect of the United States Treasury Department, *ex-officio*, visited many of the large cities of the United States and reported upon methods of schoolhouse construction. As chairman of that commission and as a city school superintendent elsewhere, I have visited schoolhouses in over thirty different states and in twenty-six of the thirty leading cities. The report is Senate Document No. 338, Sixtieth Congress, first session. This paper is a brief summary of opinions formed by myself.

In critical visits of inspection, I have seen about fifteen hundred different schoolhouses from Boston to Seattle, both inside and out; I have seen some of the best school buildings in the land, and I have seen some of the worst. How bad some of the worst are none will believe save upon the evidence of their own senses.

In respect to schoolhouses, progressive men may be found in two different groups. One group is still trying to find how to make improvements in construction and equipment over anything yet realized. The other group is trying to spread abroad the knowledge of the good buildings already erected. Until my serious visitings began, I belonged to the first group. I have still a certain interest in their problems. But at present I am strongly of the opinion that our most useful work will be in bringing the mediocre and inferior communities up to the standards of the better communities. The purpose of this paper is, therefore, not to discuss the fascinating problems of invention in schoolhouse construction, but to present emphatically certain principles of standardization.

The first difficulty that I find in respect to schoolhouses is that there is no economic motive for replacement. Old buildings stand too long. Occasionally there is a community that has been outstripped by some other community or desires to outstrip that community, and therefore tears down old buildings to build better, but such instances are few. Occasionally a neighborhood improves in quality so that the old building no longer satisfies the artistic conscience, or possibly the hygienic, and by adequate political or social pressure there is a new building actually erected. But these instances make the common presence of poor old buildings only the more apparent. I have no accurate figures, but I am well within the mark when I say that half of all our schoolhouses should be torn down at once and a fourth more should be radically reconstructed. To carry them at their book values of cost, as, for want of funds for inspectors, is done in the national school census reports, and from mere indifference and local pride in most of our municipal reports, is offensive to the sound business conscience. This is no loose generalization, as I shall try to show indirectly in the course of this argument.

New Buildings Old in Design.

The second difficulty is much the more surprising; and strangely, also, it is quite as serious. The new buildings are mostly new in material only, while being old in design. They repeat all the ideas of older and more ignorant times. This is indeed the curse of public education, that it is ruled by men who think that what was "good enough" for them in their youth is good enough for boys and girls now. Or, to put the matter more plainly: our political boards do not think at all, they merely function by habit.

I know a large city that held a competition for plans for thirteen schoolhouses. Twelve architects competed, and to each of the twelve was given one building to erect, while the thirteenth building went to a man who did not compete at all. Of these thirteen buildings some were purely traditional, while one was as queer a freak as exists anywhere in the land. Its wardrobes are all shelves, built in. Its stairs are like those of dwelling houses in width and turns. Yet it cost many thousands of dollars, and, being of brick, will last, no doubt, for three or five hundred years, for it is located in a back street into which growth will never come.

Few cities employ school architects, by which I mean architects who have studied both the principles of architecture and school conditions, including the principles of the course of study, and who have been certified by their peers or superiors for this special work. The architect of the board of education of the city of Chicago was selected by strictly competitive civil service examination, and since then has, for a sufficient period of time, proceeded to design and erect buildings, thereby amply displaying the value of that method of selection when the board of examiners is itself competent. A school architect is not a man who sometimes erects school buildings, but one who devotes his life to that work. We are now building a hundred million dollars' worth of educational structures each year, and the profession may well prepare specialists for this field.

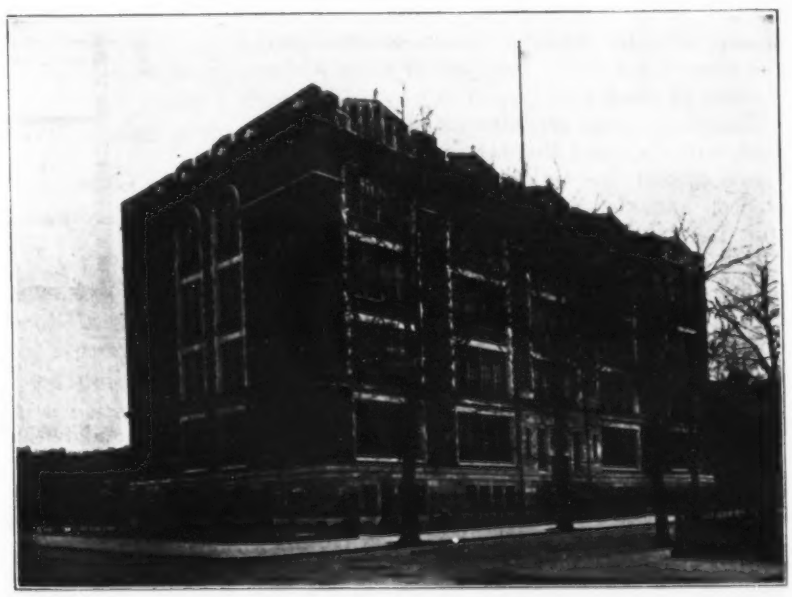
It is an unfortunate fact that not only do most boards employ no real school architect, but that half of them employ no architect at all. They resort, for the sake of supposed economy, to contractors who "design" their own buildings. I know one case well where a competent architect saved a board his entire fee for a schoolhouse by measuring up the building after it was erected and proving that it was six per cent under the cubical contents for which the board had contracted. This was, of course, a flagrant case, but cases equivalent to it are occurring every day here in America.

Because most buildings are antiquated both in material and in design, and because most new buildings are new in material only, being old in design, we have the unfortunate and illogical condition of being forced everywhere to try to carry on modern courses of study in ancient structures. The buildings are the moulds for the schools, their teachers, pupils and courses of study; the schools are not the moulds for the buildings, as, of course, they should be. The whole process of modern industry is to make the buildings to fit the business. Even our universities fail to understand this. I know one great university with millions of dollars in new and beautiful buildings, all of whose classrooms violate the principle of fenestration and lighting in that the extreme upper height of the windows is only fifty per cent of the floor width, whereas it should be at least sixty-five per cent of that width. In other words, all the rooms are too wide for the window height.

Some Fallacies Exploded.

The one great trouble with school buildings in large cities is an economic fallacy that causes their erection upon plots without playgrounds or even air space. It is held by those afflicted with belief in this fallacy that to use for playgrounds and air space a piece of ground any bigger than the floor area of the structure is

NEW FRANKLIN UNION, TRADE SCHOOL, BOSTON, MASS.
R. Clipston Sturgis, Architect. Cost $250,000.



PUBLIC SCHOOL 93, BROOKLYN, NEW YORK CITY.
C. B. J. Snyder, Architect for the Board of Education.

to withdraw so much property from the tax-list. The fallacy consists in the notion that the people are thereafter non-existent, whereas they are, in fact, merely displaced and are creating tax values elsewhere. They have been forced out upon the periphery of the community where, in most instances, they are creating greater values than if they were cooped into tenements and skyscrapers. There is one other objection to the large plot, that it costs more to acquire, but this cost is once and for all, and does not greatly influence the judicious. When bonds are issued for the cost of the grounds as well as of the building, there is the interest payable for a term of years, but this ends when the bonds are paid out of the sinking fund. Obviously the taxes upon that particular piece of land would have run forever. When a city is upon a state boundary, the displaced people may in part move into another state, but elsewhere upon the boundary there would be some offset if the policy of light and air around every schoolhouse could be fixed firmly in all minds. The health-value of the playground as a kind of public park is plain to all who think. Many are compelled to think of parks, for want of them.

Another fallacy that militates against good schoolhouses is the notion that so many teachers with so many pupils per teacher constitute a school. It follows that every classroom should be of a standard unit of size. Communities with this fallacy build all their schoolhouses alike. In one community with a hundred and fifty schoolhouses, one hundred and ten are eight-room buildings, devoid of assembly halls and indeed of every other room properly desirable for the instruction of pupils.

A third fallacy, associated closely with the second, is that to every child belong one desk and one chair, both attached to the floor, and nothing else. One great work upon comparative education of nations says that the desk and chair are the great contribution of America to the world's pedagogy. This is said with sincerity, not irony.

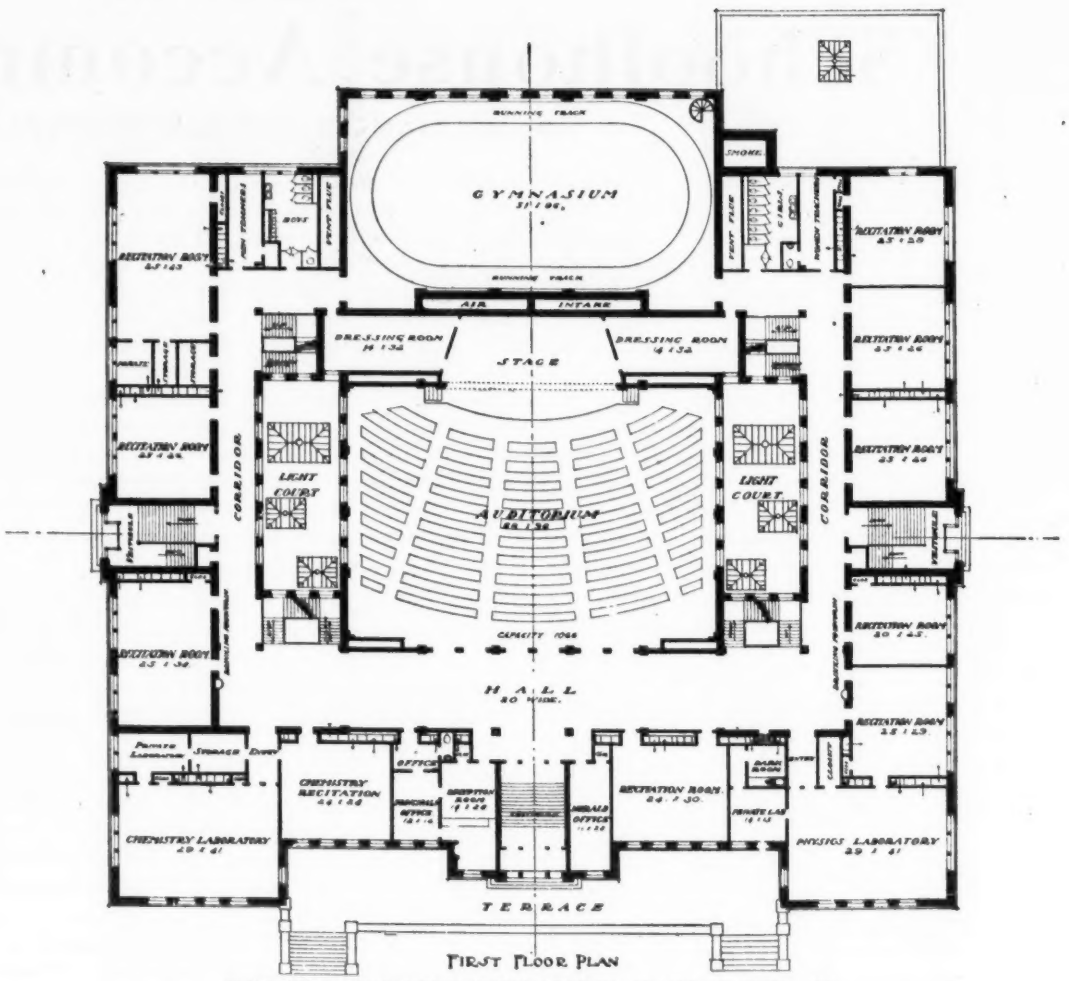
Essentials of Construction,

The first requirement of a good schoolhouse, considered as a structure for the accommodation of children, to make them and their teachers comfortable and to keep them healthy, is that it must be so orientated as to have in every classroom at least one hour of sunlight daily. Sunlight is the great germ-killer and healthmaker. By this standard half the schoolhouses in America are at once condemned. I have seen new buildings, erected at the cost of four and even six thousand dollars a classroom, in which northeast rooms took their light from the north rather than from the east, at the cost of having no sun in the rooms at any time in the day. Rooms without sunlight should be used only for storage purposes. Sunlight is quite as important as fresh air.

I know one large schoolhouse where for years, both Saturday and Sunday, inner blinds were closed so that the sunlight was deliberately excluded, and the foul school air deliberately shut in.

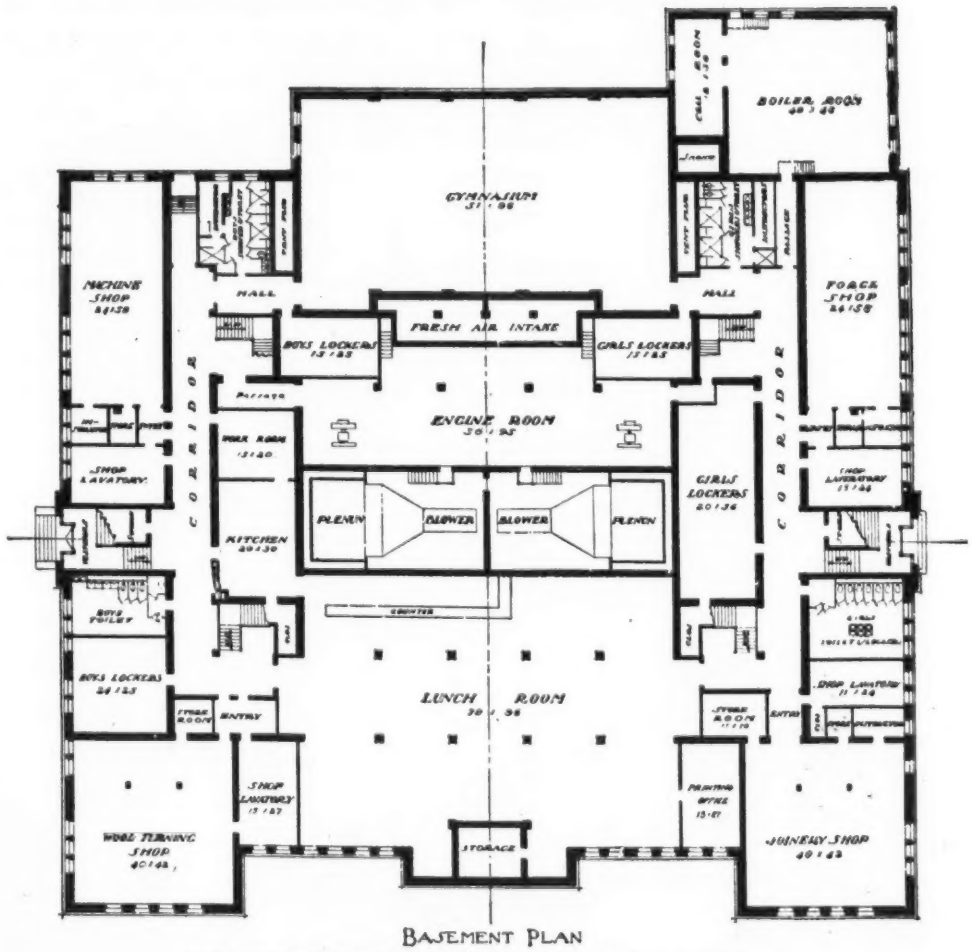
Every building of more than one story should be fireproof. To secure this requisite, the District of Columbia Schoolhouse Commission raised the allowance for each classroom from $5,000 to $8,000, and congress appropriated money accordingly for the future buildings. Other cities have, I am glad to say, the same high, yet unquestionably proper, standard.

Schoolhouses should be as panic proof as possible. Children are peculiarly susceptible to panic. To avoid panic, there are two requirements. Of these, the first is that the hallways should not be unduly wide. For a hall with four classrooms opening upon it and two stairways down and out, a width of fourteen feet is ample, and twelve is not insufficient. A hall with eight classrooms and four stairways need not be over sixteen feet wide and should not exceed eighteen. The second requirement is that the stairways should be over four and a half feet wide, but under five and a half feet. Of such stairways, there should always be two at least, whatever be the number of upstairs rooms. For a floor of over four classrooms, there should be one stairway for every two rooms.



First Floor Plan

THE NEW WESTPORT HIGH SCHOOL, KANSAS CITY, MO.

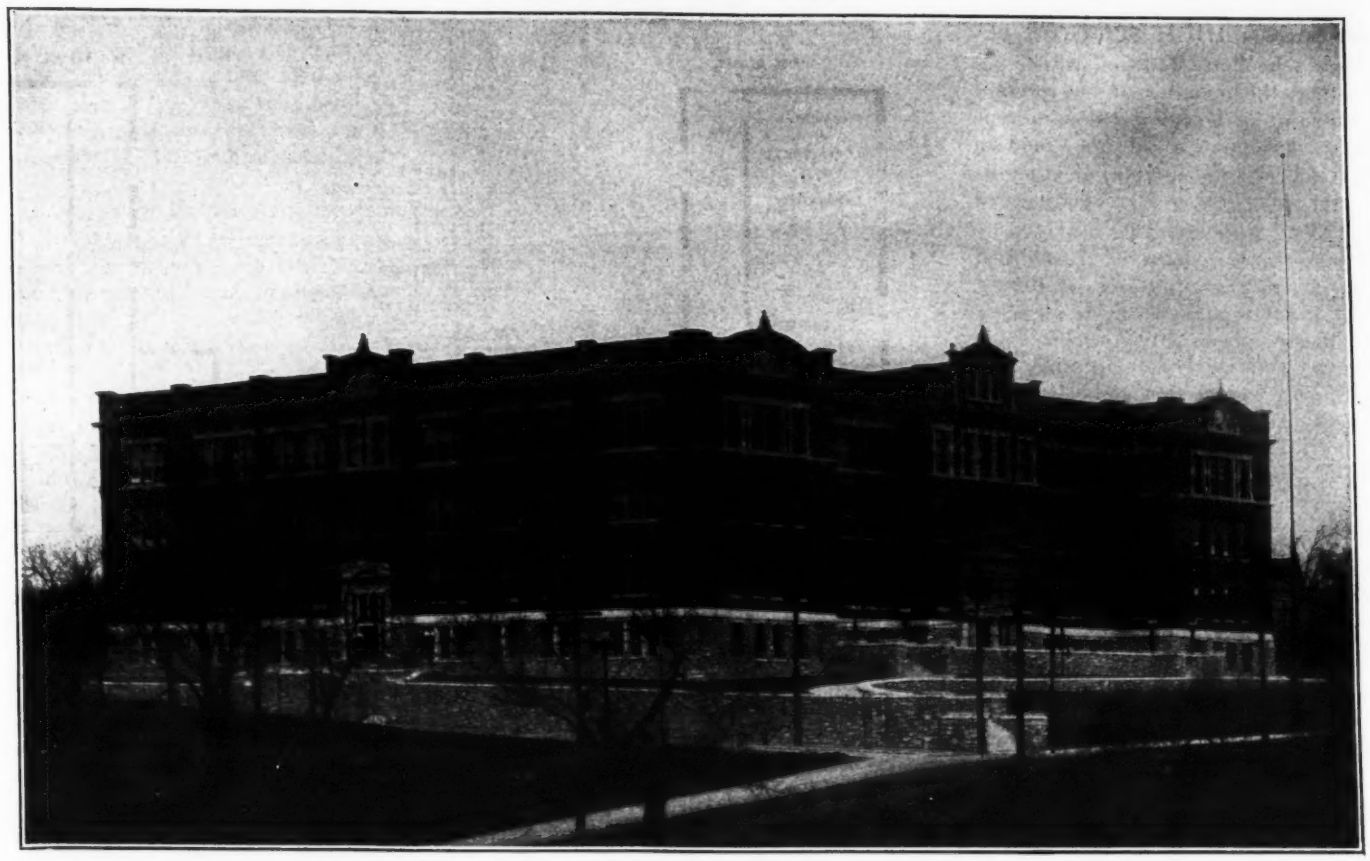


Basement Plan

THE NEW WESTPORT HIGH SCHOOL, KANSAS CITY, MO.
Charles A. Smith, Architect.

Type and Height of Buildings.

I doubt, and I have worked over this matter with men who have spent millions of dollars, whether it really saves money in construction to build four-story schoolhouses. No schoolhouse should have rooms for class use above the second floor. But if a schoolhouse is built



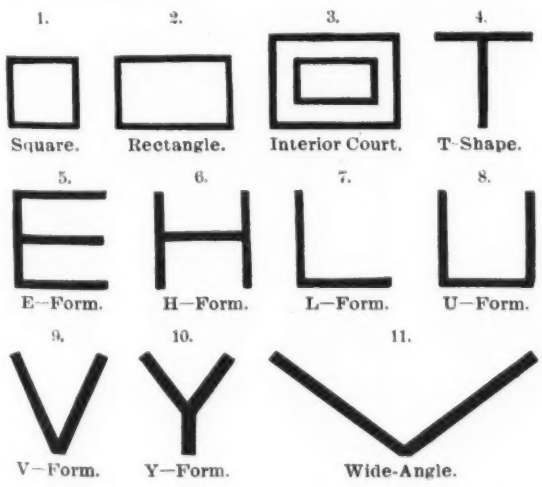
NEW WESTPORT HIGH SCHOOL, KANSAS CITY, MO.
Charles A. Smith, Architect, Kansas City.
Cost $450,000, with site and equipment. Mr. J. M. Greenwood, Superintendent of Schools.

(See plans on pages 4, 5 and 8)

with four floors in use, then without question its stairways should be built upon the New York plan, by which each stairway may be utilized for both ascent and descent at the same time, within the same space, incredible as this may seem.

Every school hallway should be amply lighted from end to end. This seems axiomatic, yet I know a generally good schoolhouse in a fine New England city, in which the main hallways have no light at all. Incidentally, it may be noted that the halls are five feet wider than they should be. Thereby the public suffered a great extra cost in room, the danger of crowding in panic was increased, and the management of classes when moving made difficult.

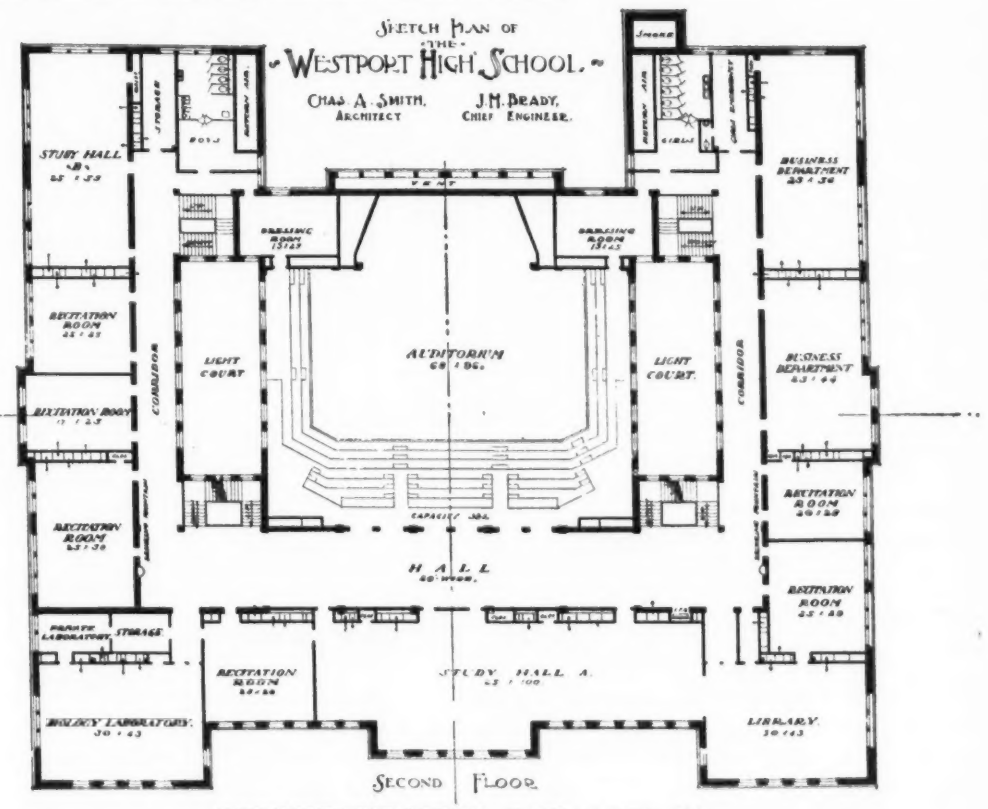
In order to provide upon school plots buildings that conform to all these conditions, the architect needs to understand the resources of a dozen different plans. These typical plans may be enumerated as



Of these plans each has its peculiar merit. The square is useful for small schoolhouses of four rooms to a floor or less. The most flexible plans, for large buildings, are the 5th, the 6th and the 8th.

Other Requirements of Buildings.

But there are other requirements than these for schoolhouses that will take proper care of the child and of his education.



WESTPORT HIGH SCHOOL, KANSAS CITY, MO.

The best plan for toilet accommodations is that in Chicago, where these conveniences are located in towers, with access from each floor. The old basement crowd is to be no more. Something is to be said for the toilets outdoors, when well ventilated and cared for, but the true solution is that which provides a separate closet for every group of a hundred pupils.

Another requirement is that each child should have at least twenty square feet of floor space in each classroom where he recites, not merely in the classroom where he studies. He needs an equal floor space for his play yard, whether indoors or out. The allowance in some states of fifteen feet is not enough.

Almost everywhere in the United States schoolhouses require forced ventilation. I merely note this point in passing. It is of so great importance that many lives of expert engineers are being given wholly to it.

Besides the classrooms, schoolhouses require such additional rooms as these, viz.: 1. Assembly hall. 2. Exercise or physical culture drill halls or gymnasiums, preferably one for each sex. 3. Drawing room or studio. 4. Music room. 5. Principal's office, teachers' rooms, and janitor's room. 6. Shop and work rooms for manual training, domestic science and art, and the trades which should be welcomed. 7. Science and art museums. 8. Library and reading room.

This will cost money, is indeed costing money. The annual expenditures of this nation for education were $200,000,000 ten years ago. Last year they were $425,000,000. By 1920 they will

(*Concluded on Page 20*)

THE MADISON HIGH SCHOOL.

The new high school at Madison, which has been in use since the opening of the present school year, may safely be presented as a type of the highest development of the modern American high school. One thousand students are provided every physical convenience needed for their high school courses.

The building is in the shape of a modified letter "E" and covers a ground area of 192 by 138 feet. The exterior is a most pleasing adaptation of the Jacobean style, which lends itself particularly well to school buildings. A rough vitrified brick, widely variegated in color, with Bedford stone trimmings, are the materials employed.

Entering the building from the front the visitor finds himself in a large vestibule, from which two stairways descend into the basement. The basement proper contains, in the right wing, manual training quarters for the boys, joinery and finishing rooms, wood lathe room and machine shop, and a mechanical drawing room.

To the left are the business and typewriting rooms, a sewing room, bicycle storage, a cooking room, and a suite of rooms furnished like a modern flat, in which girls may receive practical demonstrations in housekeeping.

The upper part of the gymnasium, with its running track, occupies the middle portion of the basement. Two stairs flanking it lead to the sub-basement, on which the floor of the gymnasium is placed. The latter is flanked on either side by the shower baths, toilets and fan rooms. To the rear, in an addition, is the forge room and the boiler and coal rooms.

Returning to the main floor we find to the right of the entrance a reception room and separate private rooms for the city superintendent of schools and the principal. Here are located the automatic telephone exchange, from which any part of the building can be reached, and the automatic program clock for uniformly indicating and regulating work periods. Beyond, there are three class rooms, large enough to seat 54 pupils each. To the left of the main entrance there are four class rooms and a small recitation room.

The middle portion of the building is the large assembly hall, beautifully lighted from a skylight and windows set up high on the sides, and seating comfortably 900 persons. On either side are broad stairways leading to the floors above.

The second and third floors are practically identical with the first floor. On the second there are eight standard sized class rooms and four recitation rooms, which will seat 25 pupils each. A teachers' emergency room occupies the space above the main entrance.

Both wings on the third floor contain a series of laboratories, recitation rooms and lecture rooms. The latter are ingeniously arranged to allow the use of the space beneath the raised tiers of seats by the instructor.

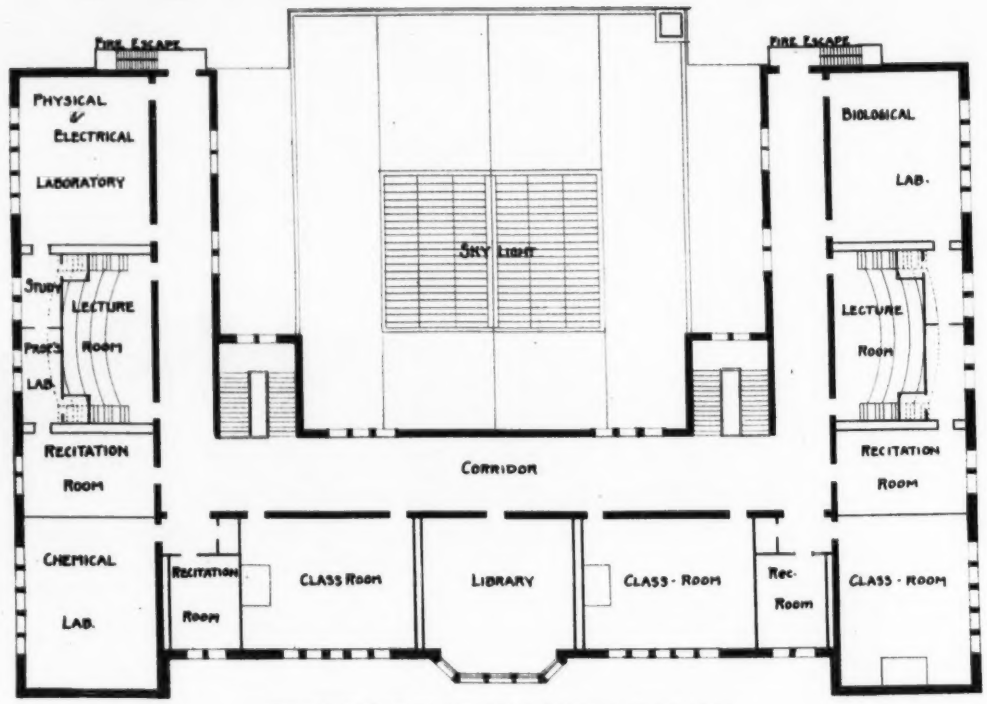
The corridors in the entire building are faced with pressed brick and floored with concrete. The class rooms are plastered with Rockford plaster and have Georgia pine wood trim, stained dark brown.

The heating is effected by a combination direct-and-indirect steam system, provided with Johnson thermostats. Warm fresh air for ventilation is introduced by means of two fans in the sub-basement.

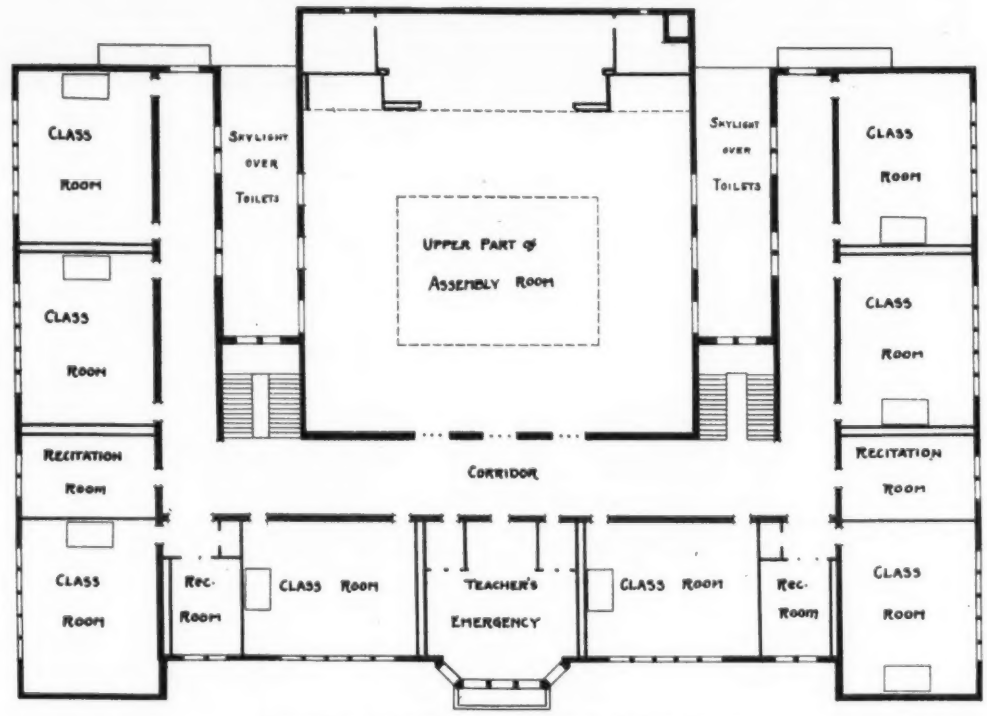
A feature of the building is a complete "Aero" vacuum cleaning plant.

Including furniture the building cost $250,000, of which $25,000 was spent for the heating and ventilating apparatus.

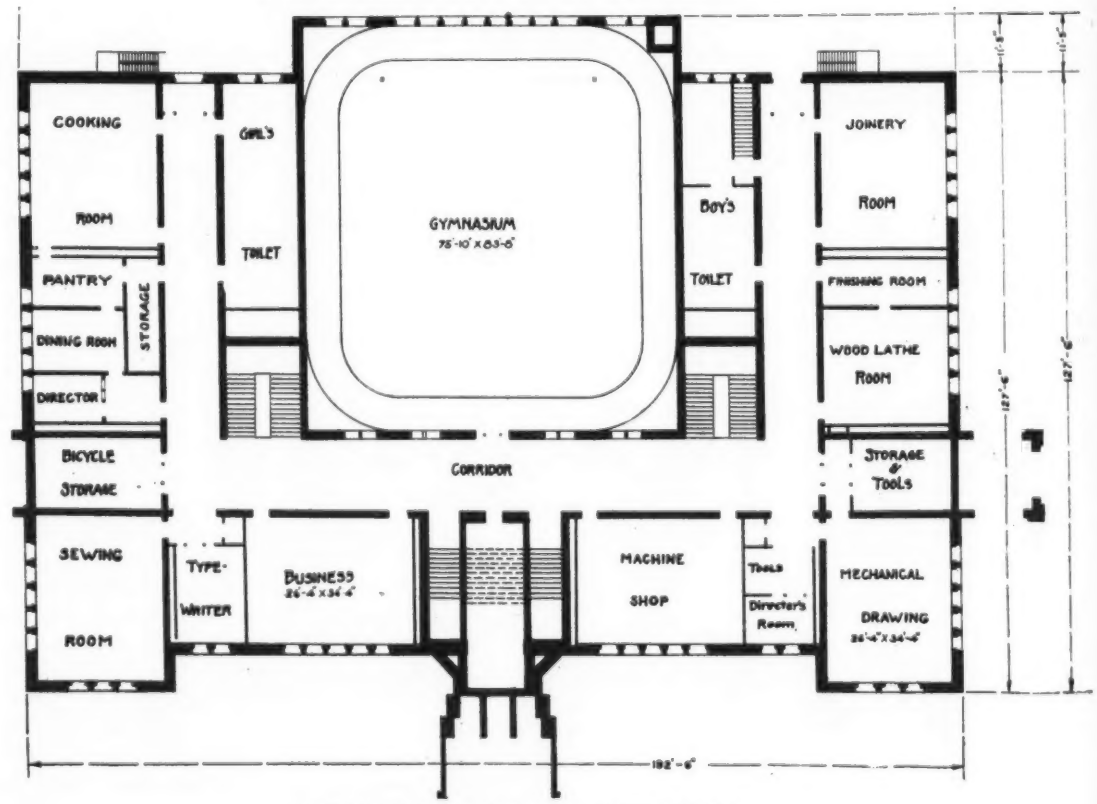
For the use of the drawings we are indebted to Supt. R. B. Dudgeon. Mr. Cass Gilbert of New York City was the architect.



THIRD FLOOR PLAN, MADISON HIGH SCHOOL.



SECOND FLOOR PLAN, MADISON HIGH SCHOOL.



BASEMENT PLAN, MADISON HIGH SCHOOL.

SCHOOL HYGIENE NOTES.

A commission of five physicians appointed by the Boston school committee to inquire into the spread of tuberculosis in the public schools reported last month that it "believes that 5,000 is a conservative estimate of the total number of tuberculosis children in the public schools of Boston."

The report is largely of an academic character. The first part deals with the results of recent investigations in foreign countries and it is on the conclusions drawn from this data that the recommendations of the commission are very largely based for treating tubercular children.

The commission recommends "that more systematic and thorough examinations be made of all suspicious children and of all found to be of tuberculous parents."

It divides these children into three general classes:—

"Class 1. Those cases already well advanced which do not belong to the schools at all.

"Class 2. Less advanced, but definitely tubercular, both open and closed. Here the problem is primarily one of health, and education should be the secondary consideration if the two conflict. For these the commission would recommend outdoor schools; that these children be placed under the care of a hospital department, which would furnish food, clothing, etc., as for any other patient, the school department merely keeping school for them. The work of the single open-air school in Boston and the first school in Providence are highly commended.

"Class 3. A large class, where the tubercular process is not so evident nor so advanced as to give rise to definite symptoms; the 'sickly' child, the 'scrofulous' child, and many cases of closed but definite tuberculosis can be included here. These should remain entirely under the school department. For them it would be wise to have in every schoolhouse an open air room, where the windows were always open."

Richmond, Va. The state board of education recently issued formal notice to all the country and city division superintendents of schools to enforce strictly the regulations of the state regarding the vaccination of pupils attending the public schools.

Atlanta, Ga. The school board has appointed a physician at a salary of 2,000 and a trained nurse at $750 to take charge of the medical inspection of the public school pupils.

Knoxville, Tenn. For years the janitor in the city school buildings with his feather duster has been a familiar figure, but no more will he be seen. The city board of education has placed the ban on the feather duster.

ALLEGANY COUNTY HIGH SCHOOL.

The new Allegany county high school, erected in Cumberland, Md., is the design of Architect Geo. F. Sansbury. The building contains six class rooms, a library, an assembly room, an office and a teachers' room.

In the basement, which has ceiling 13 feet high, will be located a manual training room, a laboratory and a domestic science room, in addition to the wash rooms and furnace rooms.

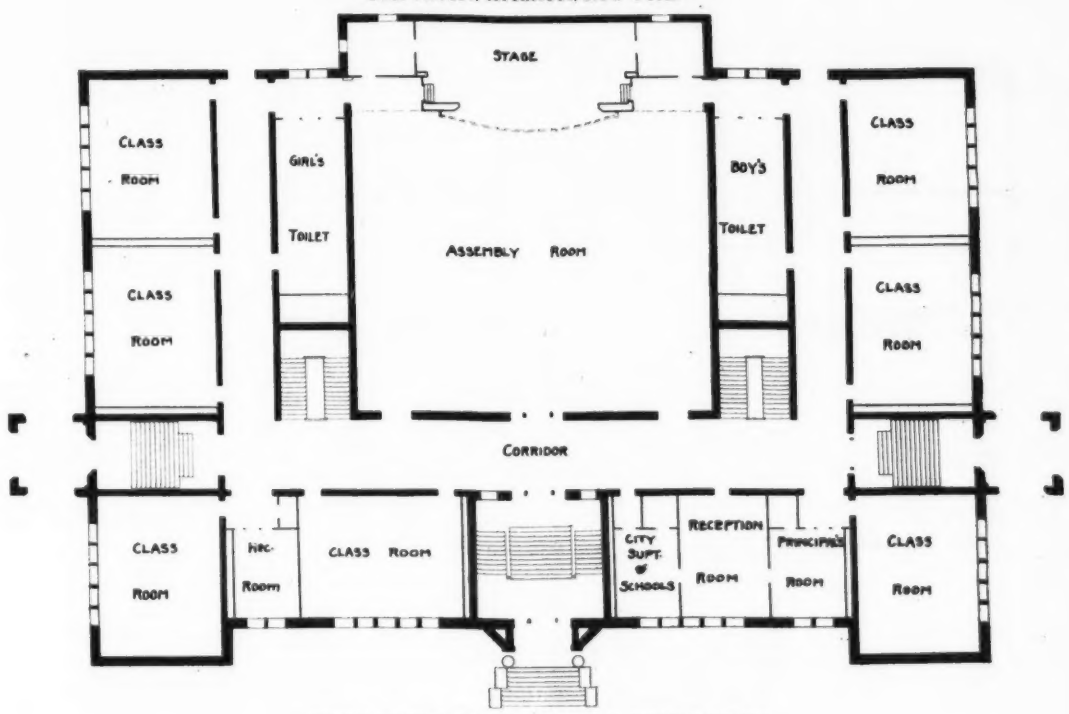
All the partitions are of brick and the stairway leading to the basement is enclosed within brick walls. The plan contemplates an auditorium back of the present building on the first floor, with class rooms above.

The heating system consists of a steam direct and indirect system.

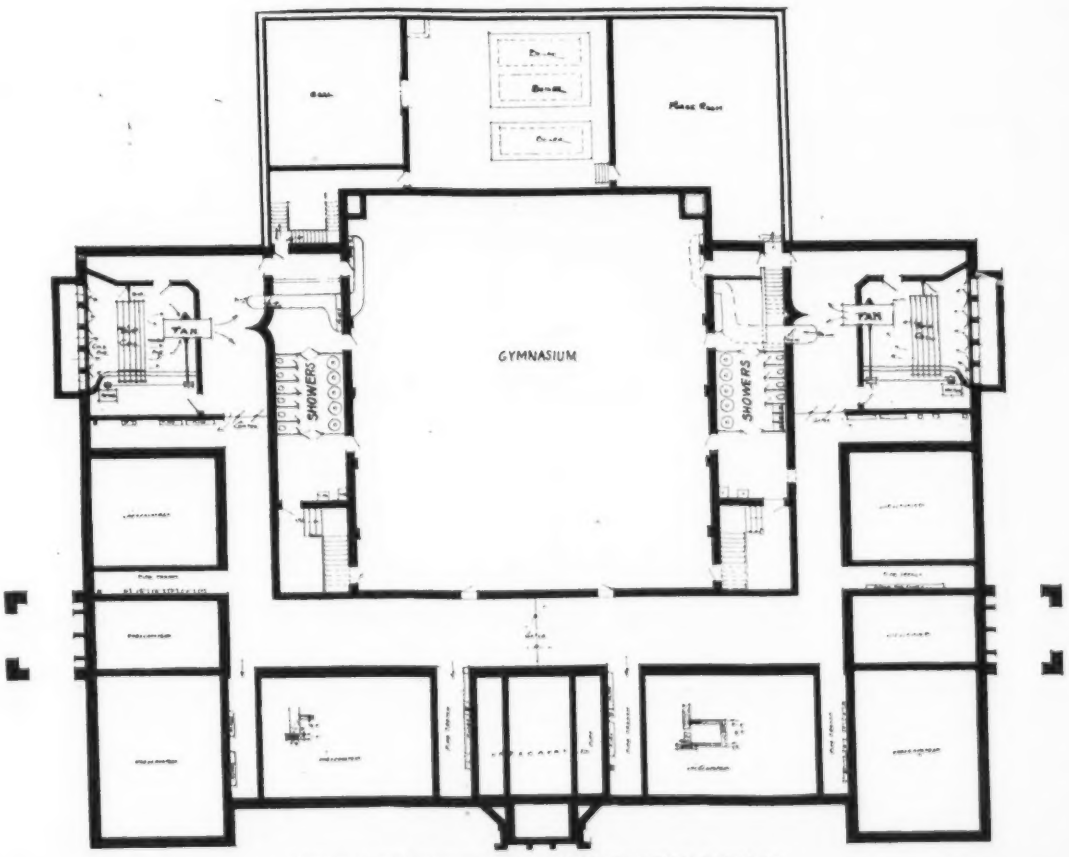
Des Moines Employs Architects.

The school board at Des Moines, Iowa, has permanently employed the architect firm, Wetherell & Gage, to prepare plans for new school buildings. The architects are devoting their entire time to a study of the requirements of the city to evolve a type of building best suited for local needs and conditions. They have visited St. Louis and other cities to inspect examples of urban school architecture, with this idea in view.

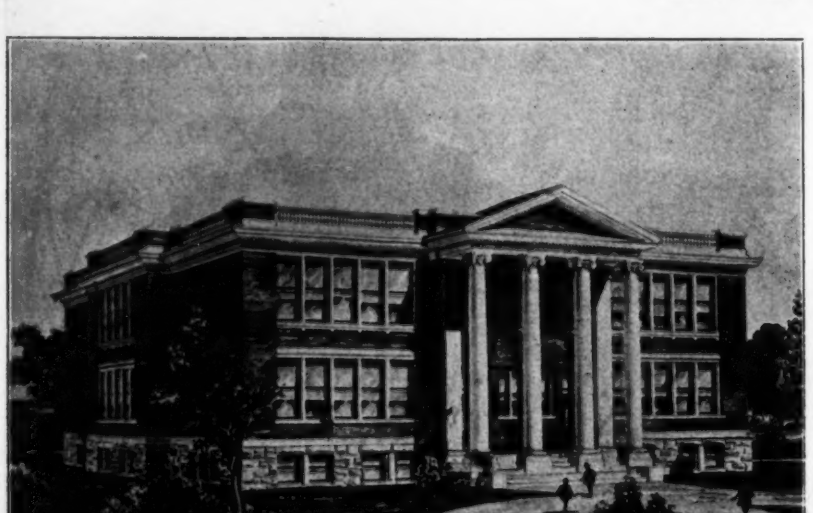
THE NEW HIGH SCHOOL, MADISON, WIS.
R. B. Dudgeon, Superintendent of Schools.
Cass Gilbert, Architect, New York.



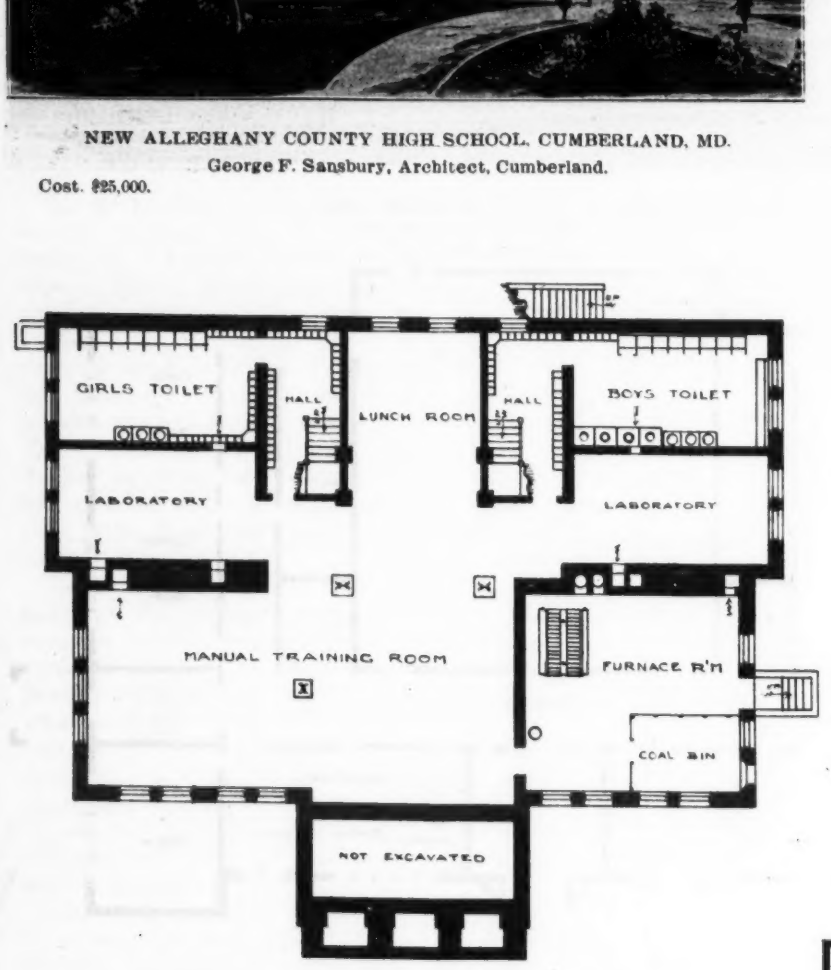
FIRST FLOOR PLAN, MADISON HIGH SCHOOL.



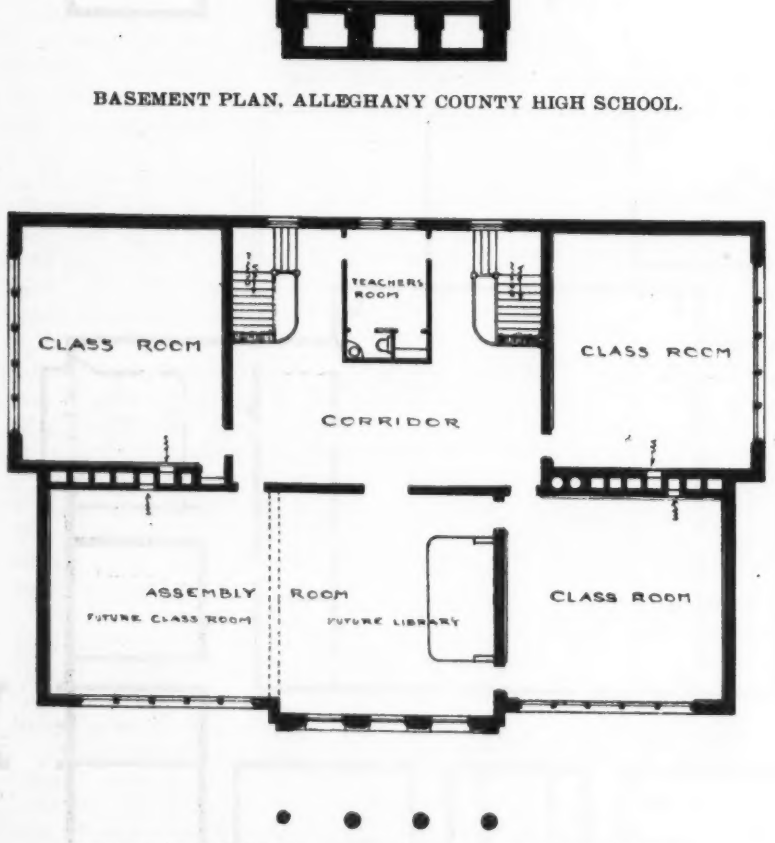
SUB-BASEMENT PLAN, MADISON HIGH SCHOOL.



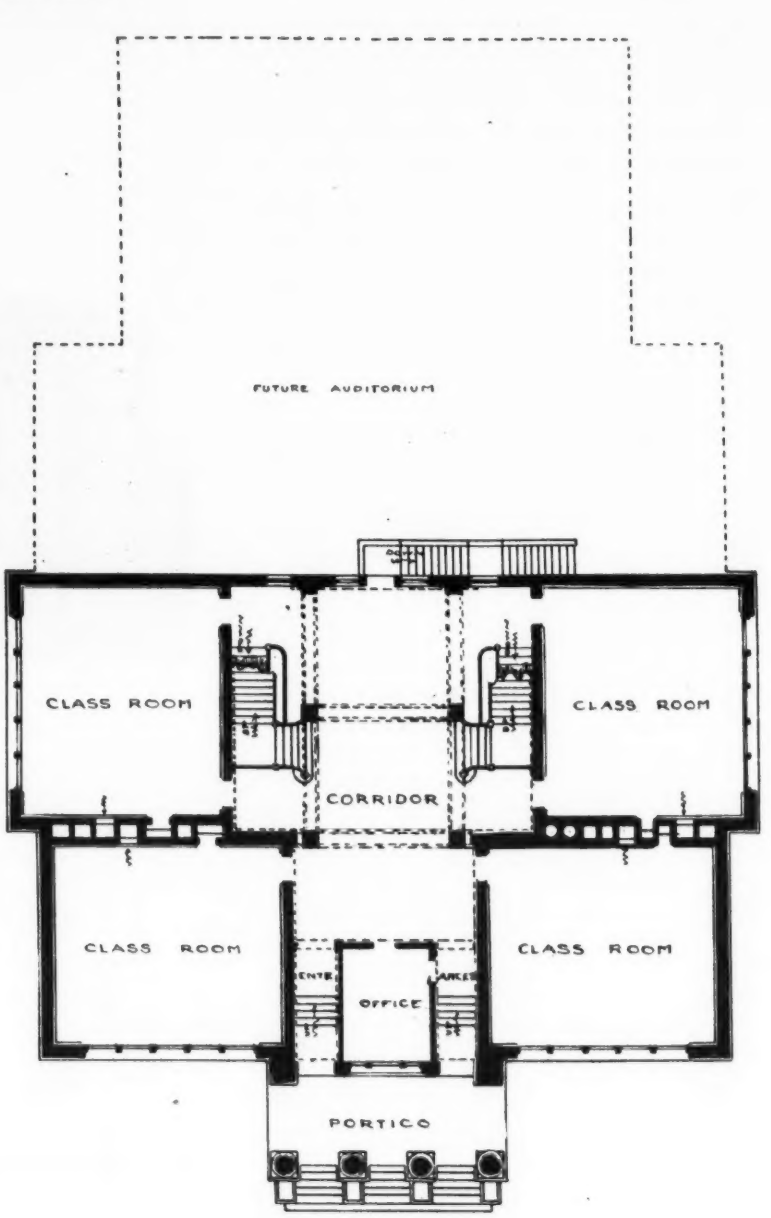
NEW ALLEGHANY COUNTY HIGH SCHOOL, CUMBERLAND, MD.
George F. Sansbury, Architect, Cumberland.
Cost. $25,000.



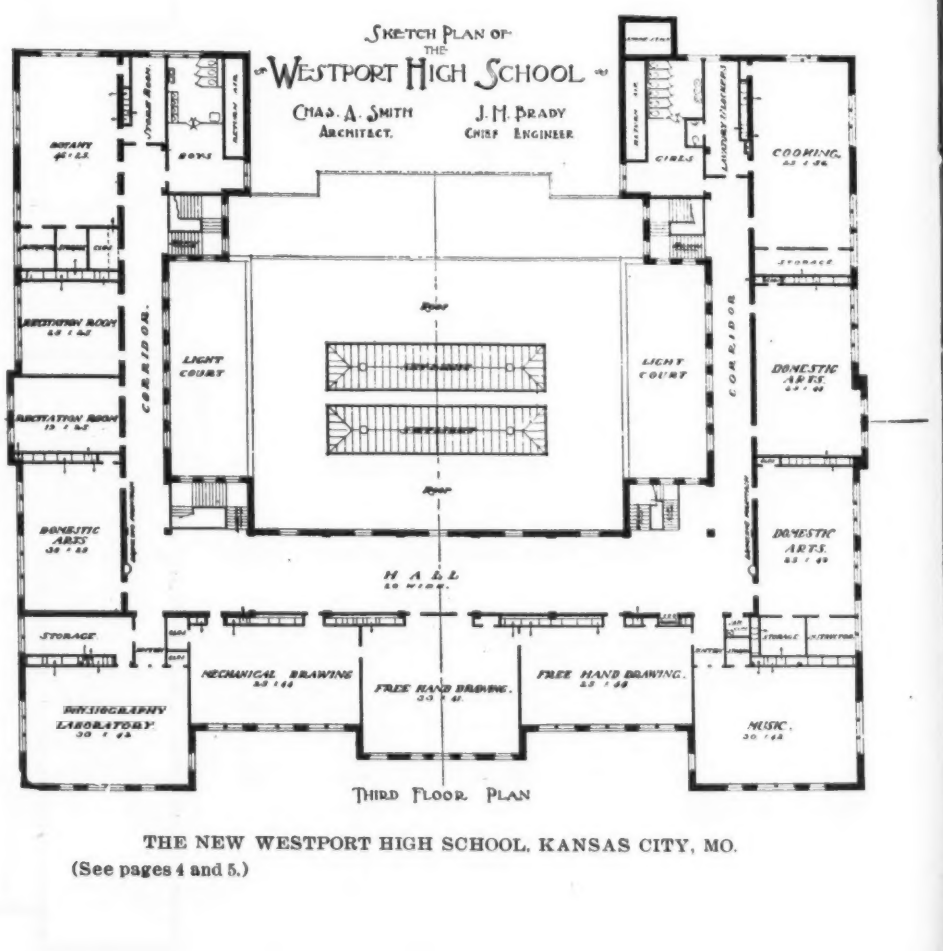
BASEMENT PLAN, ALLEGHANY COUNTY HIGH SCHOOL.



SECOND FLOOR PLAN, ALLEGHANY COUNTY HIGH SCHOOL.



FIRST FLOOR PLAN, NEW ALLEGHANY COUNTY HIGH SCHOOL, CUMBERLAND, MD.
Showing arrangement for addition to contain classrooms and an auditorium.



THE NEW WESTPORT HIGH SCHOOL, KANSAS CITY, MO.
(See pages 4 and 5.)

The Effect of Schoolroom Temperature on the Work of Pupils

By LINNAEUS N. HINES, Superintendent of Schools, Crawfordville, Ind.

One of the present day problems is the heating and ventilating of buildings. It is within only the last few years that any great amount of attention has been paid to the proper introduction and distribution of air into buildings in correct amounts and heated to the right temperature. Through thousands of years architecture did not concern itself very much with properly heating and ventilating the edifices the construction of which it directed. The development of the study of medicine, of hygiene and of the proper conditions for the welfare of the human organism has led to a fuller appreciation of what that organism needs. The rise of the warfare against lung diseases and what has been learned about their causes and the conditions under which they originate and thrive have brought the world to a fuller understanding of what is needed to preserve and lengthen human life.

Today, despite what the world has learned, no greater crimes of ignorance against the public health are committed than those that are committed against young and old through defective planning of our homes, our schools, our churches, our railway coaches and all the places where people congregate. Nothing is so cheap as pure air, yet so sparingly is it provided in the great majority of our public buildings and in our dwellings that, in spite of the great warfare against the white plague, that fell disease continues its dreadful devastation throughout the populations of the earth.

The Lack of Ventilation.

The greatest sins of carelessness and indif ference are committed against the children that are in our public schools, the sins of compelling children to attend our schools for so many hours every school day in the year and then and there depriving them of the cheapest and most necessary of God's gifts to man, fresh air. The compelling of children to attend school is correct, but the forcing them to spend the school hours in poorly ventilated and improperly heated schoolrooms contributes as much perhaps to the poor health of the youth of our land as any other one cause.

The laws of every state ought to provide that the heating and ventilating of schoolrooms should be in the hands of a commission of experts who should no more allow school to be held in a room improperly heated and ventilated than it would allow school to be held in a building that is afire, or that is about to fall down, or that has been closed on account of smallpox cases developing therein. Certain rules for heating and ventilating buildings should be laid down and every patron of a school should have the right to go to court and prevent the holding of school sessions in buildings that should not come up to the requirements exactly.

Schoolrooms are not properly ventilated throughout the length and breadth of our country. They are overheated and they are underheated. All these things are crimes against the childhood and youth of our land. A smallpox case appears in a school and there is at once the greatest excitement for fear that the children generally will be stricken. Pupils are kept in poorly ventilated and improperly heated schoolrooms year in and year out—their health is undermined—diseases of the breathing organs develop—results more disastrous than those produced by the smallpox are produced, yet school authorities and patrons go on in their careless and criminal ignorance, sacrificing the health and even the lives of the pupils that are under their care. To my mind, it is more dangerous to sit for one whole day in a room full of foul and improperly heated air than it is to undergo the danger of contagion from smallpox. Some time our slowly moving public opinion will demand that the health of our school children shall be more carefully guarded.

Varieties of Temperature Control.

In the foregoing I have said much about ventilating and heating buildings. I would not have you think that I am confusing the two or that I am losing sight of the subject of this paper. In the minds of ignorant school authorities everywhere, heating and ventilating a school building are one and the same thing. It is true that the two things are interwoven and are generally treated together in all works upon the subject, but the subject of the proper temperature alone presents many interesting problems. A study of the subject may upset few theories, but it will at least present some interesting phases.

For a generation, perhaps, men have seen the need of contrivances whereby buildings may be heated by means more effectual than the old fire place and the more recent stove. Ingenuity has supplied the need. But there has arisen a new need, and that is the controlling of the temperature of our buildings—schools, churches, homes. Schoolrooms should be neither too hot nor too cold. The temperature in such rooms should remain at practically the same point all the time. To attain that end has been one of the problems of the heating expert in recent years. No architect and no set of school authorities that pretend to have even a half-way notion of their responsibility will construct a school building at the present time without providing for the very best means of controlling the temperature of the building they propose to erect. Control of the temperature may be of any one of three varieties—automatic control, janitor control, and teacher control. The first is the best—the second system, janitor control of the temperature, may be almost as good as automatic control, but is likely to be much worse. The poorest system of all is that in which the teacher is depended on to see that the room is at the right temperature.

Teacher control of the temperature of the schoolroom is the poorest because the teacher that is thoroughly wrapped up in her recitations will forget to adjust dampers and cutoffs. Further, being in the room, variations in temperature will not be so readily noticeable. A faithful janitor of a building, if he is given the proper apparatus, can control the temperature of the schoolrooms better than the teachers in his buildings. The automatic apparatus will do the work best of all.

The Advantages of Even Temperature.

The proper control of the temperature of the schoolroom has two advantages. First, by holding the temperature at the right place there is an immense saving of fuel. That is a minor point. Second, the keeping of a schoolroom at an even temperature tends to secure the health and comfort of both teacher and pupils. To quote one authority, "A classroom that is too cold causes physical discomforts which may result in ill health. A classroom that is too hot is even worse. The average teacher will resort to an open window for relief. The draughts from these open windows are certain to bring on coughs and colds which only too frequently end in throat and pulmonary troubles. The cause of education is as much promoted by hygienic surroundings and physical comfort of pupils as by teachers and textbooks."

As ventilation and temperature are closely associated, so are temperature and humidity. The percentage of moisture in the air of the schoolroom, we are told, has much to do with the amount of heat necessary to keep the room's occupants comfortable. The house atmosphere during the winter months in our country is about as dry as that of a desert. The drier the air in a room, the higher will have to be the temperature in order to insure physical comfort. School experiments in Boston indicate that a degree of humidity ranging from 40 to 50 per cent in the winter time is correct. In all experiments as to the right amount of heat necessary for a schoolroom, it must be borne in mind that the humidity of the atmosphere in the room has much to do with the problem. In the tests described below, however, the element of humidity was not considered.

Most authorities seem to agree that the temperature of schoolrooms should be kept uniformly at seventy degrees. The Pennsylvania legislature passed in 1905 a very practical law governing the erection of school buildings. This law provides that all buildings shall be properly lighted, ventilated and heated, and that the buildings shall be "warmed to maintain an average temperature of seventy degrees Fahrenheit during the coldest weather." The only trouble with the law is the word "average" in the passage just quoted. A temperature ranging from sixty to eighty degrees might average seventy degrees, but it would be very injurious to the health of the pupils. If the law should require an absolute temperature of seventy degrees throughout all the hours of every school day during that part of the year when artificial heat is required, it would come much nearer enforcing perfect conditions.

Overheating and Its Results.

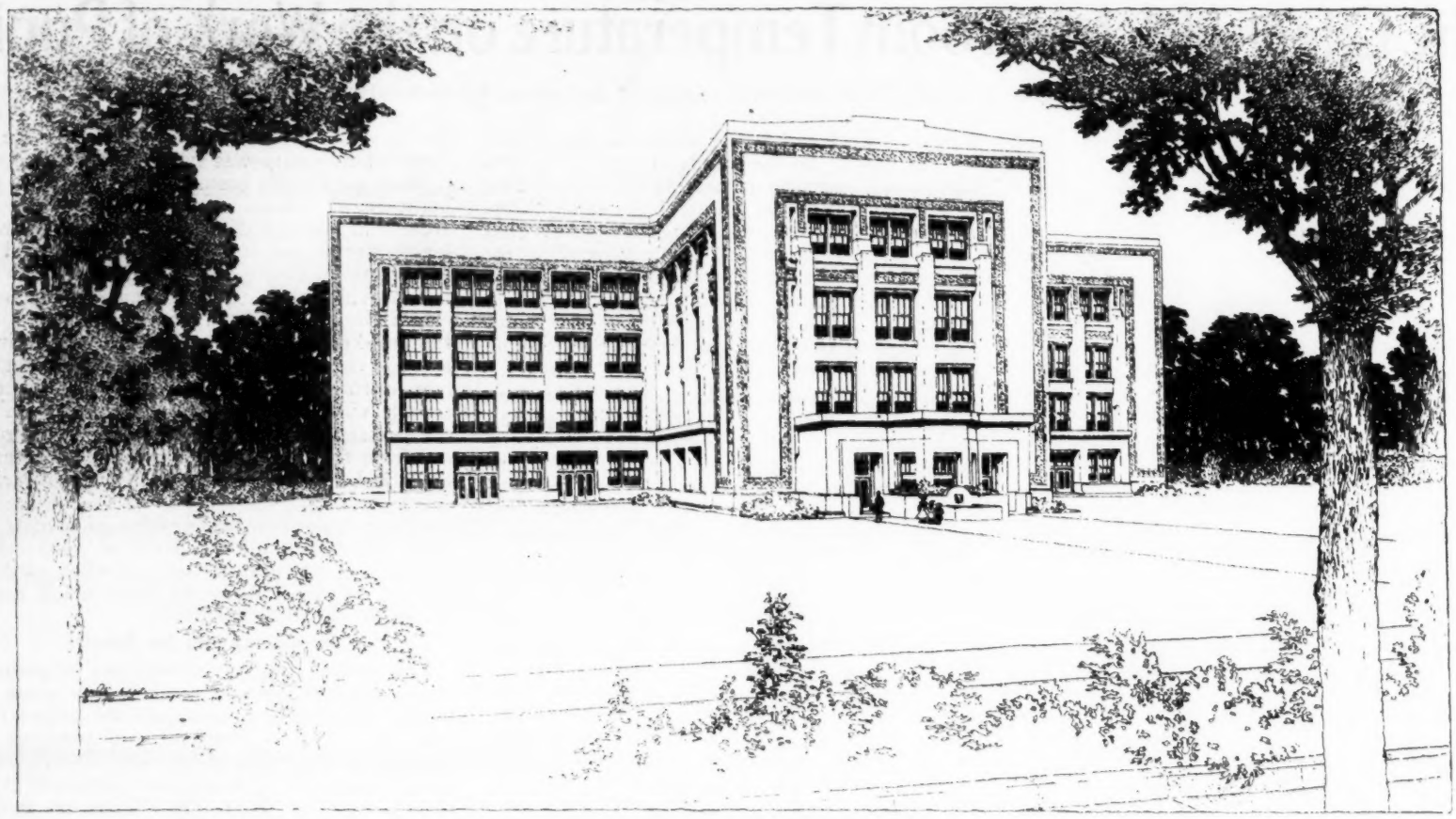
The overheating of schoolrooms is probably the commonest form of misdemeanor along the line of attempting to maintain the proper temperature. Fuel is plentiful and furnaces are made to do full duty in the way of consuming their daily toll. Americans generally keep their houses too warm. A schoolroom that is too hot causes the children to perspire. Going forth into a cold atmosphere causes chilling. Manifold cases of many diseases follow such action. Low temperatures likewise produce their evil effects. The physician is all too familiar with the harvest of sickness and death that the schoolroom has prepared in hundreds of communities. Many as are the physically evil effects of keeping children in improperly heated schoolrooms, there are added mental effects that show themselves in the work of the pupils from day to day.

It has been said above that most authorities seem agreed that a temperature of seventy degrees is the proper one to maintain in the schoolroom. That may be true in some localities. However, it is the firm belief of the proponent that a temperature of sixty-eight degrees or even slightly lower would be far better not only for the general health of the pupils in our schools, but for securing mental results from their work. I believe this to be especially true of such a climate as has Indiana—considering the humidity that prevails there and other climatic conditions. If the individual never suffers himself to remain in an atmosphere heated above sixty-eight degrees, he readily adjusts himself to the condition and is comfortable. Further, he can do better mental work. It is the commonest kind of an observation that when a schoolroom becomes too warm, the pupils become dull and listless. They do not work so readily nor so accurately. Usually the higher the temperature above a certain narrow latitude of average temperature, the poorer the results. Further, on the other hand, if a room is allowed to become too cold, the results are almost as poor. There is a happy medium somewhere on the thermometer, and it is that medium that many efforts have been made to find.

Experiments in Overheated Rooms.

Recently, in the school system with which the writer is connected, some experiments along the line of the effects of different temperatures on the work of pupils were tried. These experiments were tried in three different rooms, in three different buildings. The pupils were all of the sixth grade. The teachers, B. G. Keicher, L. B. Lookabill and Frank McGeath, helped in the experiments. The pupils knew nothing of what was going on, except that they were asked to undergo certain mental tests occasionally. The effects of the different temperatures were made note of. Some of the notes were as follows: Temperature of 80 degrees, the class was restless, dull and incapable of continued mental effort; 76 degrees, the class

(Concluded on Page 20)



NEW NOBEL SCHOOL, CHICAGO, ILL.
Dwight H. Perkins, Architect for the Board of Education.

THE NEW CHICAGO 1909 TYPE.

The Nobel School.

The building as planned will be entirely fireproof and will have a capacity of twenty-six class rooms, and six rooms to be used for special purposes, such as office, manual training, domestic science, drawing, construction work, kindergarten and a library.

This is not a flexible plan arranged to be built in sections, but is designed for construction all at one time, when the need of a large building is apparent from the beginning.

The library is located upon the ground floor, with separate direct entrance. It may be used jointly for school purposes, and as a branch of the Chicago Public Library whenever such combination is desired.

The kindergarten is located opposite this room so as to permit the younger children to enter into the building without climbing stairs.

The main floor of the assembly hall is located in the second story, with its gallery on a level with the third floor.

Above the assembly hall is located the gymnasium.

The stairs are located as follows: two flights in front of the assembly hall up to the level of the gallery, for use by the public independently of the school stairs or corridors. Two flights are at the center of the building running full height of building, and two more stairways are located at the ends of building—one at each entrance.

Tower toilets for pupils are located on each floor; the girls' and boys' at opposite ends of building.

On the ground floor at the different ends of building, is located a large play room—one for each sex. This play room gives direct access to the playground in front of the building, as shown on the situation plan. This playground is so arranged that it may be equipped with swings, horses, giant strides, running track, etc.

The exterior of the building is to be built of brick and terra cotta, of light color. The attempt has been made in designing to give the maximum amount of light in class rooms, there being a proportion in this building of one square foot of glass for each four square feet of floor area. The height of the window opening is one-half the width of the class room. All top floor class rooms and special rooms have in addition to the exterior windows, skylights placed over them.

The corridors, class rooms, etc., are to be wainscoted with burlap to the height of the blackboards, which are to be of slate. All toilet rooms are to be lined with enamel brick work the full height of the room. The assembly hall is to have a wainscoting of enameled brick with plaster finish above. The floors of class rooms, assembly hall, etc., are to be of wood. The floors of corridors, toilet rooms and play rooms are to be of asphalt.

FIREPROOF SCHOOL BUILDING.

AT COST OF ORDINARY CONSTRUCTION.

Albert L. Thayer.

Following the Collinwood disaster the Ohio legislature passed an act governing school house construction and placed all school buildings under the supervision of the Department of Inspection of work shops and factories.

One of the requirements of the code prepared in conformity with this act, and which applies to all school buildings in the state, is that each school room in a non-fireproof building shall have a separate and distinct means of egress in addition to the usual entrance through stair case halls and corridors. To comply with this requirement Boards of Education all over the state have been compelled to practically cover their old buildings with fire escapes.

To avoid the unsightly appearance of the exterior fire escape and the expense of repairs, and still comply with the code, a type of plan has been created for new buildings in which a fireproof stairway is introduced between each pair of school rooms. In order to offset the additional cost of these fire exits leading from each school room in the building the main halls have been reduced to a minimum, in fact, making simply a stair hall in place of the roomy halls and rotunda effects that were formerly in vogue.

Another feature of the code, which in itself is commendable but adds to the cost of non-fireproof building, requires that the heating apparatus be inclosed in a fireproof room.

The sketches shown herewith of the school building being built at Struthers, Ohio, shows what can be done in a fireproof building at a very nominal sum.

The cost of this eight-room building complete, including heating system, is $20,640. The walls are brick, the floors and roof are constructed of reinforced concrete, supported by steel beams. The inside partitions are built of terra cotta partition tile. The stairways, balustrade and floors in hall are cement. In fact, the only wood used in the building is the floors in the school rooms, the sash, doors and blackboard moldings. The wood floors in school rooms are nailed to wood strips embedded in the concrete, leaving no space beneath the floor. The usual wood finish around the windows is omitted, the corners of the plaster being rounded as in hospital construction. Wood wainscoting is done away with, and in fact everything made as sanitary as possible. The school rooms are lighted entirely from the left of the pupils, the windows extending well up to the ceilings. Space for pupils' coats and hats is provided by means of a fireproof screen seven feet high at the rear of each room. Each school room has a teachers' cupboard, and a teachers' retiring room is provided over the main entrance.

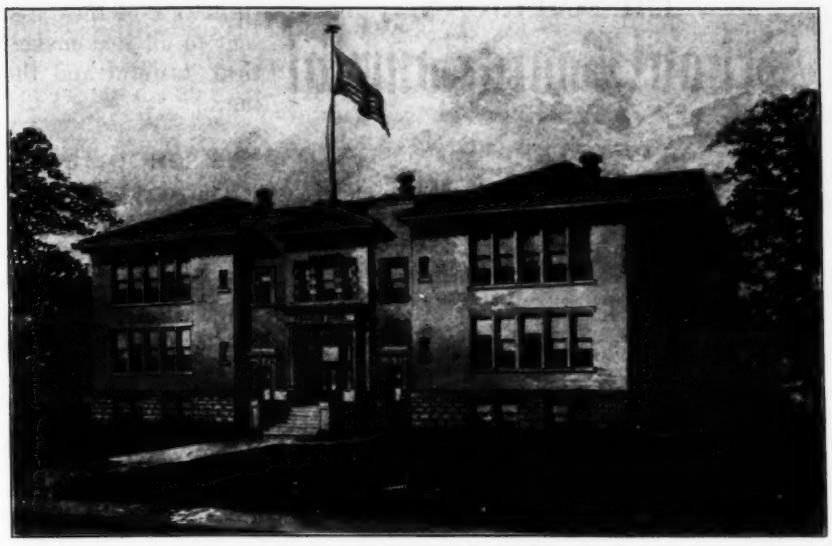
This form of construction we have used extensively for the past ten or twelve years in our school work in New Castle, Pa., and have advocated it in our work in many other places in Western Pennsylvania, Eastern Ohio and West Virginia, where we found that the additional cost above the ordinary wood construction does not exceed ten per cent of the cost of the building. Under the restriction of the present Ohio school code the fireproof or first class construction will not exceed the cost of second class construction.

We believe that from a business standpoint alone the additional cost of ten per cent is justifiable in that the building is more substantial, will last longer and need less repairs than any form of wood floor construction. Another important feature is that the floors are more effectually deadened than can be done by any other means.

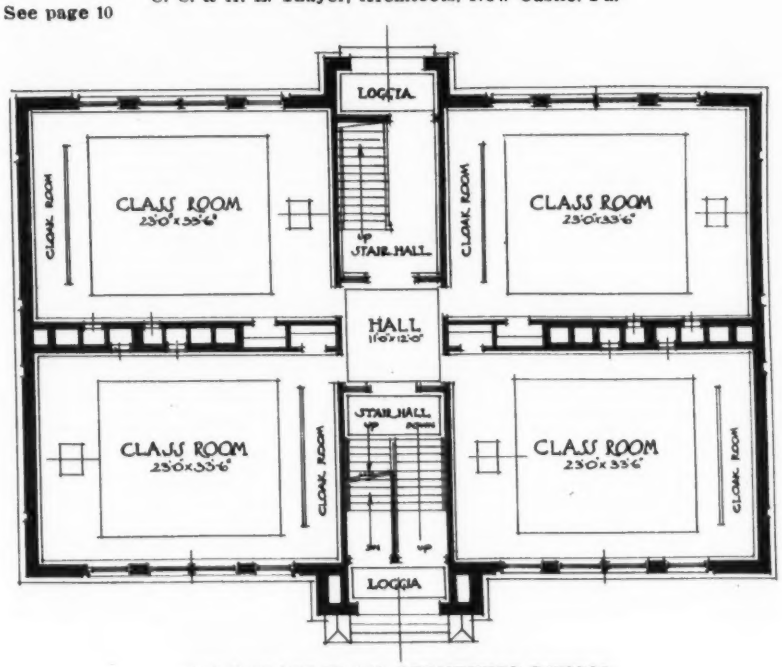
And, finally, when combustible material is eliminated as nearly as possible from the construction of a building, the risk from fire and panic is reduced to a minimum.

NEW SCHOOL, STRUTHERS, O.
C. C. & A. L. Thayer, Architects, New Castle, Pa.

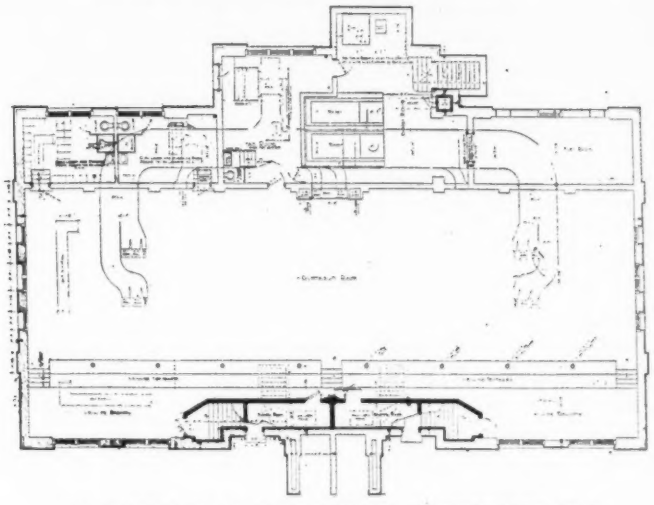
See page 10



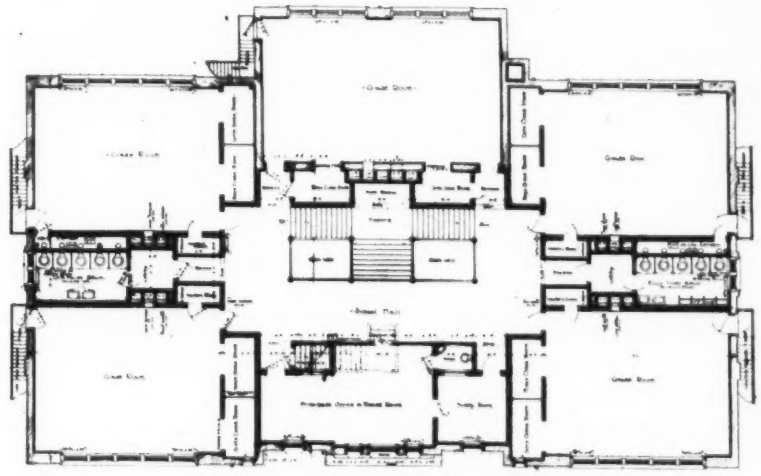
NEW SCHOOL BUILDING, JAMESTOWN, N. D.
Joseph Bell de Remer, Architect. Fargo, N. D.



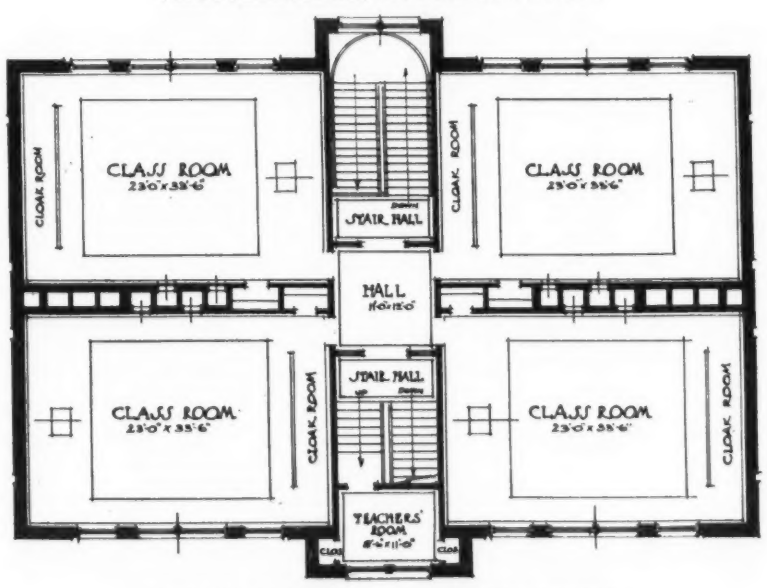
FIRST FLOOR PLAN, STRUTHERS SCHOOL.



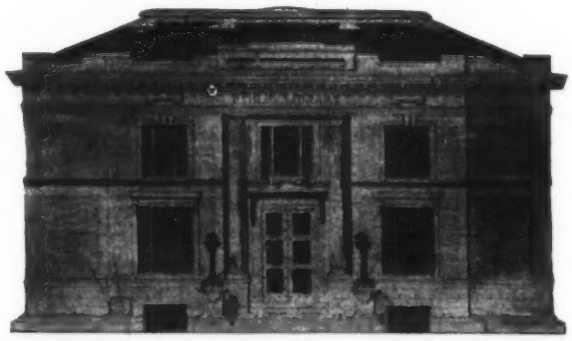
BASEMENT PLAN, NEW SCHOOL, JAMESTOWN, N. D.
Showing Gymnasium with Spectator's Gallery.



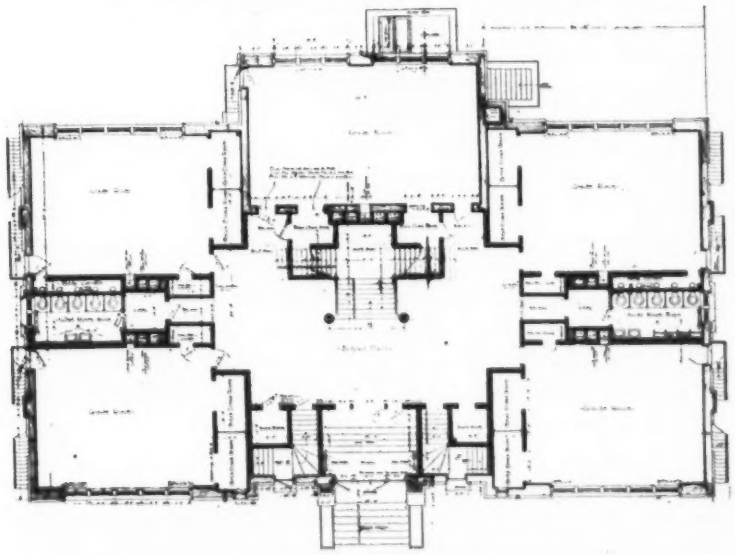
FIRST FLOOR PLAN, NEW SCHOOL, JAMESTOWN, N. D.



SECOND FLOOR PLAN, STRUTHERS SCHOOL.



School design by Robinson & Reidy, Jacksonville, Fla.



SECOND FLOOR PLAN, NEW SCHOOL, JAMESTOWN, N. D.
Joseph Bell de Remer, Architect. Fargo, N. D.

THE AMERICAN
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MODERN SCHOOL ARCHITECTURE.

If any one need to be convinced that school architecture has made enormous strides in recent years a glance through the pages of this journal would furnish ample proof. The presentation of perspectives and floor plans of the school building of today compared with those of even ten years ago will readily demonstrate the fact that tremendous progress has been made.

The merit of the modern schoolhouse lies in the fact that it meets in the largest measure the needs of the school. It is more than a mere series of rooms, corridors, stairways and entrances. It provides a thoughtful and even ingenious orientation of space with a view of obtaining the highest degree of utility from an administrative point of view. Its appointments give due consideration to the health and comfort of the inmates. In brief, beyond the mere housing of pupils and teachers, it is a positive aid to education.

From a purely artistic point of view it must also be conceded that schoolhouse exteriors have undergone a change for the better. The showy, high towered and large roofed buildings of a decade ago have given place to the simple and dignified exterior, correct in proportion and design.

Many of the older school buildings merely express an expensive ugliness and stand as monuments to a crude and undeveloped taste. They resemble a court house or a hotel rather than a schoolhouse.

The advance made in architectural design suited for school buildings is of exceptional value in other directions. Its refining influence is bound to find expression in other classes of buildings.

The propaganda made by periodicals and books for better school architecture has had its wholesome effect. The splendid models given by cities like St. Louis, Boston, Chicago and New York, and some cities of the west, have had their influence upon hundreds of school men and architects. The school boards of these cities have permitted their architects to engage in innovations, eliminate faults, introduce improvements and forge ahead with every new building.

While the mainspring of this progress is found in the thoughtful and studious architect, it must be conceded that such progress could not have been achieved without the cooperation of the school authorities. School principals and superintendents have gained a greater familiarity with the essentials of a well arranged schoolhouse. The school board member has manifested a keener appreciation of these essentials and a readier assent to all that makes for a convenient, practical, tasteful and thoroughly modern building.

SCHOOL BOOK LEGISLATION.

The revulsion which has manifested itself in the public affairs of the nation in several states has finally extended itself with unusual fierceness to the book companies. There has been more or less text book tinkering in legislative bodies for many years. Crank legislation was never wholly absent. But the attention which has been given in recent months to text book questions, or rather to publishers' methods, has taken a more serious form.

The inquiries and investigations which have been instituted are the result of certain abuses which have crept into the book business. No one familiar with actual conditions will deny this. That the period of readjustment would arrive sooner or later was reasonably to be expected. The bills introduced have chiefly related to methods of adopting books, and to regulating the cost of the same with a view of preventing excessive and discriminatory charges.

In Michigan a similar situation exists and new state law, fixing prices and limiting the choice of books to a list compiled by a state board, is proposed.

In Illinois the exposures of price discrimination in Chicago and other municipalities have led to the introduction of a bill which will, if passed, provide state uniformity at prices which resemble those of Kansas.

The most serious agitation took place in Minnesota, where a legislature investigation and a grand jury inquiry have uncovered much alleged interference on the part of book agents in the employment of teachers and superintendents and the election of city and state school officials. A state uniformity bill limiting the prices of books is before the legislature, but is being strenuously opposed by all of the school men.

In the state of Indiana a determined effort was made to repeal the state uniformity act and return to local adoptions in the counties and cities.

The peculiar competition to which the school book business has at times been subjected has tempted its representatives to resort to undesirable methods. Abuses once established are not readily eliminated. Well meaning publishers frequently, as a matter of self-defense, have permitted their representatives to stoop to methods which they themselves have condemned and still condemn. Abuse has been met with abuse; unfairness with unfairness; illegitimate method with illegitimate method.

If conditions have arisen in the relations between publishers and school authorities which do not appeal to honest men, it may also be said that the blame is not entirely confined to one side of the contracting parties. If the text book representative has resorted to corruption, it is also because some school official allowed himself to be corrupted. It takes two or more to enter into a corrupt bargain.

The modern school book publisher, no doubt, is desirous of eliminating the evils which have fastened themselves upon his business. He is willing, too, that legislative action be resorted to. He deprecates, however, as do many railway managers, all extreme measures. The publisher wants fair play and a proper recognition of the mission and purpose of his business.

Here it is not intended to defend the evils which are complained of or the publishers who resort to unwarranted methods. But it is argued that the average publisher, in fact the great majority, is anxious to eliminate all illegitimate methods and place the school book business upon a high and clean basis. He thoroughly believes that merit and adaptability ought to determine all text book adoptions.

NATIONAL AID.

Under the energetic direction of Commissioner Elmer Ellsworth Brown, the United States bureau of education has shown admirable enterprise in issuing helpful bulletins for the use of school officials and students of education. The annual reports of the commissioner are now being issued with gratifying promptness.

Two of the best recent publications of the bureau are an annual bibliography of works on education and a biennial digest of legislation and judicial decisions relating to public education.

The latter bulletin, prepared by Dr. Edward C. Elliott of the University of Wisconsin, is a most complete compilation covering the period from October 1, 1906, to October 1, 1908. It offers in compact and well classified form all new school laws and important court decisions which school administrators and legislators may wish for, in making a comparative study.

This bulletin, we think, is a strong contribution toward realizing the purposes of the bureau of education and making it a real factor in the progress of the public school system.

PRECEDING THE SCHOOL BUILDING.

The purchase of land for the erection of new school buildings is always a difficult and not rarely an annoying task. An indiscreet board of education can readily embarrass an entire school system. A site for a new school may be the cause for lawsuits, scandals and personal enmities. The intelligent school board will secure a site without legal proceedings, without a thought of graft and without noise.

In smaller cities, where news, like gossip, spreads with lightning rapidity, the location of a new school, especially a high school, is most difficult. The very thought of a new school brings a flood of impractical propositions and suggestions. Real estate men and interested landholders besiege and bring pressure to bear on board members. Usually every offer or suggestion is useless as well as impossible, and the school board must go on a hunt for a site.

A month need not expire before board members have encountered almost insurmountable obstacles. There is on the one hand the property owner who will not discuss the idea of selling his land. The next sets a price as exorbitant as though the land were to be sold by the pound. Mothers' and neighborhood clubs

make suggestions as to location. Citizens whose property adjoins contemplated sites file petitions against their purchase, claiming great depreciation in values. And so the board is annoyed and embarrassed until in disgust it pays twice the price of the real selling value for any piece of land.

Where possible in growing localities boards of education ought to be allowed to purchase property in advance of immediate needs. Even though the property may stand idle for some time taxes will not accumulate. While the interest on such an investment is temporarily lost, in the course of time a saving will be effected which will more than quadruple the amount lost.

Unquestionably the disinterested real estate man working temporarily as an employe of the board of education, with no axes to grind, but only a commission to earn, can effect great savings for boards of education. His knowledge of land values will make his judgment on the price of property invaluable. Working purely as an agent, he can obtain figures and complete deals which the board of education as such, or its business agent, could never think of bringing into effect. Such a plan hinges, of course, upon the high character of the real estate agent.

Where such methods seem impracticable boards of education have frequently secured land by condemnation proceedings. This method usually fixes the price of property more accurately. It prevents the demand for exorbitant prices and establishes a standard below which even the hesitant or ridiculous land owner need not fall. It is legal and just, and, if properly appreciated and operated, will affect savings of money, time and worry.

CHILD LABOR AGE LIMIT.

Students of sociology have frequently charged that one of the crying disgraces of our boasted democratic institutions is child labor. They hold that our intense love and desire for universal education is shown to be deficient when the sharp struggles needed to secure any prohibitive child labor laws are considered. While other nations, like England and Germany, have stringent and effective laws, the statutes in the few states, which have acted at all, lack uniformity and are only indifferently administered. The age limit particularly is placed too low in our southern states.

Experience universally recognizes the necessity for freedom from work up to the age of fourteen years. But even this age limit is too low in the opinion of physicians and educators who have expert knowledge of the evil effects of occupations which hold children closely indoors.

Secretary C. N. Hall of the Connecticut state board of education has well summarized the reasons why the age limit should be raised from fourteen to sixteen. In a recent discussion submitted to his board he says:

The transition from childhood to youth is not complete before sixteen.

Good judgment is not possessed at any age under sixteen.

The necessary schooling for even a moderate usefulness is in most cases not acquired below sixteen.

The physical growth and development necessary for successful labor are rarely reached below sixteen.

Manual dexterity is rarely developed under sixteen.

These are truths so obvious as to need no argument. The physically hardy people are those among whom the confined work of young children is unknown.

The skilled workmen, the efficient wage earners, are not found among those who were set at confined work at twelve or younger.

The fully useful citizen is never the product of immature child labor. No girl set at factory work at fourteen or fifteen can be as efficient a home maker, as competent a mother, as she could have been had those two crucial years been retained for the freedom of childhood.

Three successive generations of child labor (between fourteen and sixteen) leave an indelible mark of deterioration upon the physique, the education, the morals and the capacity for citizenship of any peoples.

Former President Roosevelt has well characterized child labor "a blot on our civilization." It is a menace to our national welfare which deserves the serious attention of school authorities, particularly boards of education. Children between fourteen and sixteen belong in the schoolroom and not in the factory. The first step in child labor legislation should be in the direction of compulsory school attendance up to the sixteenth year. School authorities cannot better aid the good cause than by promoting the enactment of school attendance laws.

DIRTY SCHOOLS.

School hygienists have for a decade insisted upon the importance of ventilating schoolrooms and keeping the air in the same free from the contamination of the poisonous products of human respiration. The proofs of the evil effects of vitiated air which they have adduced have led to the general adoption of elaborate systems for supplying fresh air and drawing off the fouled atmosphere so as to keep the amount of noxious gases at a minimum.

The recent experiments of authorities have shown, however, that a ventilating system of the most efficient type is of little service in removing another kind of impurity in the air —the solid particles of matter—dust—which are always floating about.

Every man will remember from his own school life some day when he saw a beam of sunlight entering through a hole in a window shade or through a crack in a closed shutter which made visible thousands of floating motes.

Bacteriologists tell us that these particles are not only fine bits of inorganic matter, but that they consist largely of living microorganisms, some harmless in themselves, but often disease bearing.

It has been proven time and again that the majority of tuberculosis patients have been infected through germ bearing dust, and physicians will testify that most germ diseases are transmitted more generally by means of floating matter than by bad food or water, or by direct contact with a patient. We are prone to disregard the dangers of dust because diseases contracted by means of it are not so apparently traced to their true cause. Their action often is slow and insidious, and, therefore, all the more dangerous.

It is wholly impossible to prevent dust or to remove it entirely from the atmosphere of any room. But it is necessary to keep it at a minimum. This can be done by laying crackless floors, by using curved wall and floor connections, by omitting deep cut mouldings and ornaments and by using effective cleaning methods.

With the most hygienic construction the janitor is the key to the situation. His cleaning methods will finally determine the sanitary condition of a schoolroom, and the janitor who wields the broom and feather duster only rouses a dragon.

The damp cloth for dusting, the oil brush for sweeping, or, best of all, the vacuum process, are the sanitary means of securing cleanliness. They gather and destroy dust, and do not rouse and scatter it.

Detroit contemplates a housecleaning.

The Spelling Board amputates a Third list of words.

A suggestion for uplifting the Rural population of the United States.

ARCHITECTS' CHARGES.

The American Institute of Architects at its last convention, in December, adopted a new schedule of "proper minimum charges." These are interesting in that they apply to public school building. The schedule is as follows:

1. The architect's professional services consist of the necessary conferences, the preparation of preliminary studies, working drawings, specifications, large scale and full size detail drawings, and of the general direction and supervision of the work, for which, except as hereinafter mentioned, the minimum charge, based upon the total cost* of the work complete is six per cent.

2. On residential work, on alterations to existing buildings, on monuments, furniture, decorative and cabinet work and landscape architecture, it is proper to make a higher charge than above indicated.

3. The architect is entitled to compensation for articles purchased under his direction, even though not designed by him.

4. If an operation is conducted under separate contracts, rather than under a general contract, it is proper to charge a special fee in addition to the charges mentioned elsewhere in this schedule.

5. Where the architect is not otherwise retained, consultation fees for professional advice are to be paid in proportion to the importance of the questions involved and services rendered.

6. Where heating, ventilating, mechanical, structural, electrical and sanitary problems are of such a nature as to require the services of a specialist, the owner is to pay for such services. Chemical and mechanical tests and surveys, when required, are to be paid for by the owner.

7. Necessary traveling expenses are to be paid by the owner.

8. If, after a definite scheme has been approved, changes in drawings, specifications or other documents are required by the owner; or if the architect be put to extra labor or expense by the delinquency or insolvency of a contractor, the architect shall be paid for such additional services and expense.

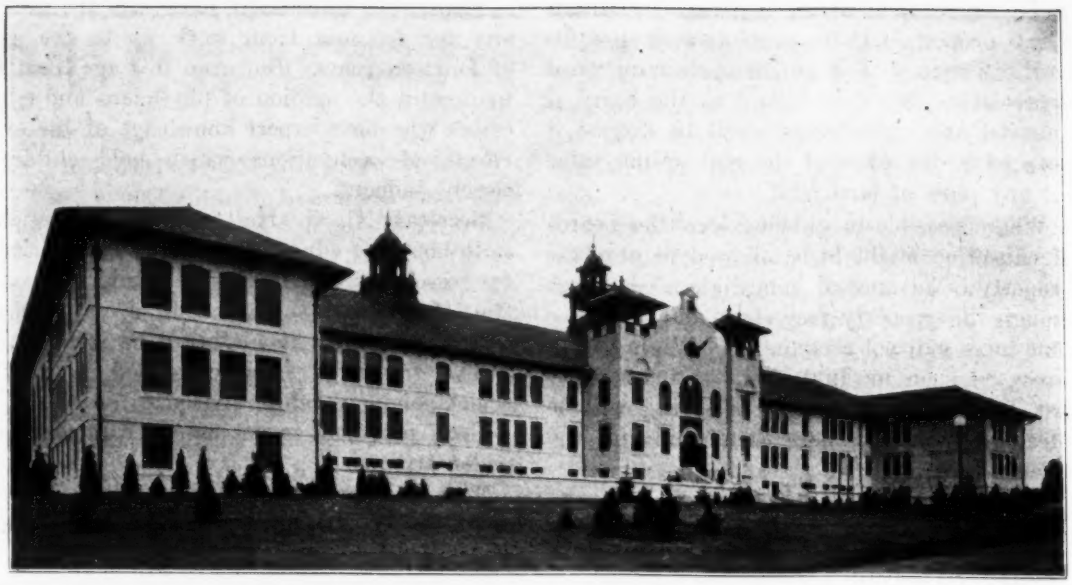
9. Payments to the architect are due as his work progresses in the following order: Upon completion of the preliminary studies, one-fifth of the entire fee; upon completion of specifications and general working drawings (exclusive of details), two-fifths additional, the remainder being due from time to time in proportion to the amount of service rendered. Until an actual estimate is received, charges are based upon the proposed cost of the work and payments received are on account of the entire fee.

10. In case of the abandonment or suspension of the work, the basis of settlement is to be as follows: For preliminary studies, a fee in accordance with the character and magnitude of the work; for preliminary studies, specifications and general working drawings (exclusive of details), three-fifths of the fee for complete services.

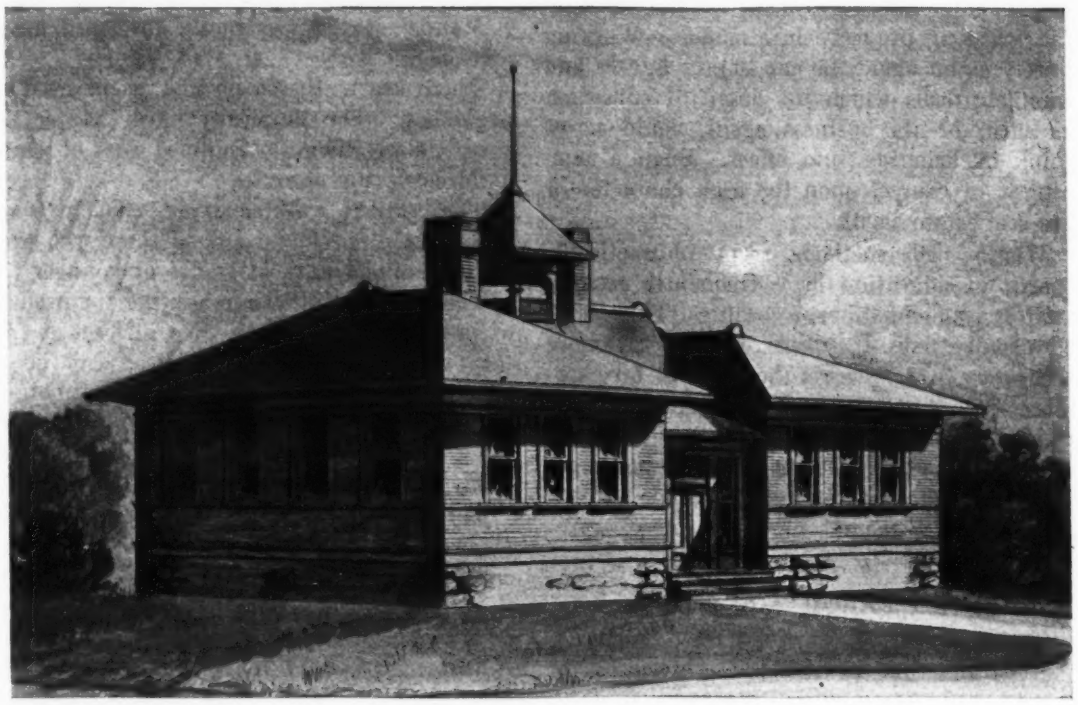
11. The supervision of an architect (as distinguished from the continuous personal superintendence which may be secured by the employment of a clerk-of-the-works or superintendent of construction) means such inspection by the architect or his deputy, of work in studios and shops or a building or other work in process of erection, completion or alteration, as he finds necessary to ascertain whether it is being executed in general conformity with his drawings and specifications or directions. He has authority to reject any part of the work which does not so conform and to order its removal and reconstruction. He has authority to act in emergencies that may arise in the course of construction, to order necessary changes, and to define the intent and meaning of the drawings and specifications. On operations where a clerk-of-the-works or superintendent of construction is required, the architect shall employ such assistance at the owner's expense.

12. Drawings and specifications, as instruments of service, are the property of the architect.

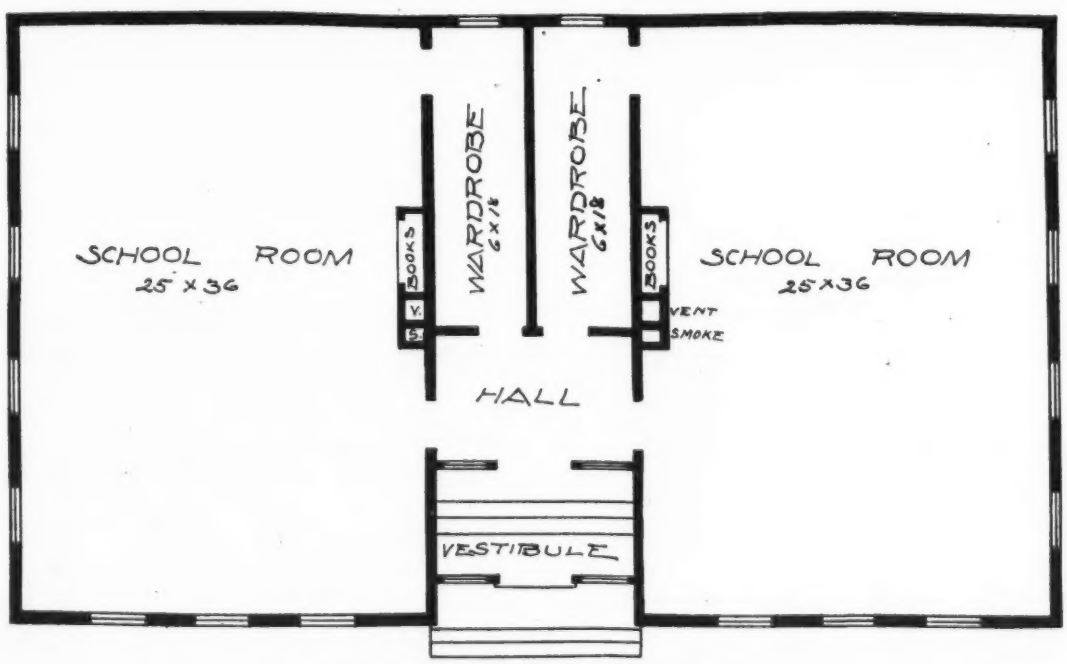
*The total cost is to be interpreted as the cost of all materials and labor necessary to complete the work, plus contractors' profits and expenses, as such cost would be if all materials were new and all labor fully paid, at market prices current when the work was ordered.



NEW STATE NORMAL SCHOOL, UPPER MONTCLAIR, N. J.



DESIGN FOR TWO ROOM SCHOOL BUILDING.
Geo. W. Ashby, Architect.



FLOOR PLAN, TWO ROOM SCHOOL DESIGN.

School Heating and Ventilation

By S. T. BRYCE, Heating Engineer, Toledo, O.

The question of properly heating and ventilating our modern school buildings is the most important question that should claim the consideration of our school authorities when about to erect new or remodel old school buildings.

The finest and most expensive building, architecturally, may be a failure as an educational institution if the pupils are not comfortably warmed and adequately supplied with pure air. A beautiful tower and an abundance of ornate and expensive exterior trimmings, though costing a great deal of money, will not accomplish this, although they may add to the architectural effect of the building and serve as a monument to the architect. Too often the school boards lose sight of the real purposes of the building, and permit their judgment to be warped and carried away by a picture of a beautiful building, although it may be woefully lacking in the most essential features, such as lighting, heating and ventilation and sanitary appliances.

In the larger educational centers the importance of these four features for promoting the health of mind and body, which also means progress of the pupils in their studies, is well understood, but in the smaller cities, towns and rural districts, because of ignorance, lack of interest or lack of funds, these essentials are often utterly ignored or lightly passed over. Even in many of the larger cities, where the best method of lighting and sanitary appliances are well understood and a standard adopted, they are still undecided and at sea regarding the best method of heating and ventilating their modern air-tight buildings, and are needing a Moses, if only a little one, to point them in the proper direction.

Within the last sixty-eight years of our country's progress, the writer has seen many changes in our school facilities, from the log cabin by the roadside to the beautiful half-million-dollar structures, and during my twenty-five years' experience as a heating and ventilating engineer in school work I have become familiar with the progress in school heating from the old wood box-stove in the log cabin of sixty years ago to the highest type of the art as applied to the present half-million-dollar structures in the larger cities. Hence, even at the risk of being accused of egotistical notions, I feel competent to offer my services, even though a very small Moses, to point the way to the best known methods of the present day.

In confining this article to the consideration of the latter methods, it is not necessary, neither will I undertake to discuss the demerits of the various other systems, such as stoves, schoolroom heaters, round pot-furnaces, direct or direct-indirect steam, which have been tried, found wanting and thrown into the scrap pile by all intelligent, up-to-date school authorities, until now it has become more a question of what is the best rather than price. To this question there can be but one answer, and that is, the mechanical or blast system. This system can be applied successfully by either a furnace or steam apparatus.

In school construction of the present day the chief aim is to make the buildings substantial, safe, fireproof and comfortable, and as nearly air-tight about the windows and doors as possible, hence the necessity of a system that will not only warm the building, but will also *positively ventilate it at all times* regardless of all conditions of wind and weather. This requirement can only be made certain by the mechanical or blast system.

Some of the states have enacted laws, and in other states common practice has adopted a standard requiring not less than thirty cubic feet of fresh air per minute to be supplied to each occupant of the building. Here again the blast system comes in, as it is the only one that can fulfill this requirement. No gravity or direct-indirect system alone can supply it.

A properly constructed school building should provide for the least possible leakage for cold air around the doors and windows. It is a gross mistake to suppose that the cold air entering the rooms in this way is any purer than the same air taken from out of doors and passed through the heating chamber, where it is warmed, and is then gathered up by the fan and forced into the various rooms at about August temperature. No air should be permitted to enter the rooms except that which is delivered at the warm air register in proper quantities and automatically tempered to the proper degree to maintain a uniform temperature. Cold air, if allowed to leak into the rooms, drops at once to the floor and spreads over the lower extremities of the occupants and causes them discomfort, and necessarily requires more fuel to heat the building.

For a blast furnace system the furnaces should be of the horizontal type, made entirely of cast iron sufficiently heavy to insure durability. A sufficient number of these to provide ample grate and radiating surface to heat the amount of air required, without overheating the furnaces, should be installed, in battery, in a brick heating chamber. From this chamber would radiate galvanized iron ducts to connect with the brick flues leading to the various rooms. Where the ducts connect with the heating chamber there should be a double connection, one for warm air and one for cold air. These should be provided with automatically controlled mixing dampers, so that the rooms could be supplied with warm or cold air, or any desired mixture of the two extremes.

For an eight-room building this type of apparatus, where installed by a specialist of experience in this line of work, gives most excellent results, but for larger buildings, unless compactly arranged so that the heating apparatus can be centrally located, I would recommend that the apparatus be divided and part of it placed in a battery at each end of the building.

For forcing the air over the furnaces and to the various rooms, a housed fan or blower, driven by a gasoline engine or an electric motor, would be necessary. I am not specifying how the brick walls and ceiling enclosing these furnaces should be built, as it may be taken for granted that due precaution would be taken by any responsible heating contractor to avoid any danger from fire.

The advantage of this system over a steam-blast system is that its cost of installation is considerably less, and thus often helps out a school board when cramped for funds, and still enables them to secure practically the same results in buildings of the size mentioned.

Steam blast, the last but not the least, is the highest type of the science of school heating and ventilation that the inventive mind of the heating engineer has been able to produce. There are three methods for installing this system. I will try to explain the main differences.

One method is to have the air with which the rooms are to be supplied entirely heated by passing it through and over a large number of steam heated coils into a plenum chamber, where, as it enters the various heating ducts, it is automatically mixed to the proper temperature as noted in the description of the furnace system. With this method it is customary to heat the corridors, toilet rooms and offices by direct radiators. These serve not only to heat them during school hours, but keeps the building from chilling off and the water pipes from freezing and bursting at night.

A second method is to install in connection with the fan and plenum chamber a sufficient number of heating coils to temper the air to about 65 degrees, and then distribute it through ducts connecting with indirect radiators placed at the base of the various heat flues, where it is reheated to the proper temperature before entering the various rooms.

This method has its advocates, but for myself I can see but a single advantage to recommend it, and as compared with the straight blast method I can see two or three points of disadvantage.

Another method of installing this system is to install about one-third of the quantity of steam coils used in the other instance, and passing all of the air over these to merely temper it to 60 or 65 degrees before it enters the schoolrooms. Then by placing a sufficient number of direct radiators around the walls under the windows or most exposed parts of the room, it is heated to the desired temperature. This method seems to be growing popular as the required amount of air for ventilation is brought into the room without any chilling effect, and the direct radiators act as a shield to protect the occupants from the glass exposure. They also keep the rooms warm over night when the fan is not in operation. The corridors, toilet rooms and the offices are heated by direct radiators by this method, the same as by the other method.

The power for operating the fan may be supplied either by an electric motor or by a gasoline engine, which will enable the heating apparatus to operate successfully on a steam pressure of five pounds, or by a low pressure steam engine, which will operate successfully on a boiler pressure of twenty-five pounds. This pressure removes all danger from explosion except from low water, and this danger can easily be avoided by using boilers equipped with safety fusible plugs.

An essential part of this system is an approved automatic temperature regulating equipment, which enables the temperature of the building to be maintained at a uniform degree at all times regardless of out of door weather.

While it is not essential to the successful operation of a heating plant of this kind, still the operation of any steam plant may be improved by a properly installed vacuum system.

While the cost of installing a steam blast system is considerably more than that of a furnace blast system, still this difference in cost is more than justified by subsequent advantages, and if a school board, about to build, finds their building fund inadequate to meet all requirements they should not begin to economize by trimming the most essential branches, but should cut out unnecessary luxuries and ornaments to bring the cost of the building within their means.

It has become the custom with some school boards, when preparing to build schools of eight rooms or larger, to employ heating engineers to prepare heating and ventilating plans and specifications and have the architects incorporate them in their general plans, and then require all the contractors to bid upon the same plans, while other boards adopt the plan of requiring the heating contractors to submit their own plans and specifications with their bid and then hold the one receiving the contract responsible for its efficiency and satisfactory operation. When this course is adopted, the bids are received and the contract awarded, the heating plans are then turned over to the architect, who incorporates them in his general plans before the bids on the general contract are asked for. In this way the entire work is harmonized and possible subsequent expensive changes avoided. I believe this is the wisest course for the board to pursue, as, instead of confining their choice to only one man's ideas and experience, as in the first plan, they have the engineering ability and experience of possibly a dozen men, who are directly interested in the perfection of their plans, to choose from.

An additional reason for this course, which should recommend itself to the board, is this, that heating contractors, who have not the experience or ability to engineer a suitable heating plan, are seldom competent to trust with its execution, and hence it eliminates this class of competition and the possible risk of the contract falling into the hands of incompetent and irresponsible parties.

A Ventilating System for Rural Schoolhouses

By FRANK M. RICH, North Weymouth, Mass.

No money that a school board has to invest ever brings better returns in the cause of education than a few dollars put into an adequate system of ventilation. Good air in a schoolroom means good health, good order, good work. Bad air means a condition of dullness, discomfort and disease, which not only destroys the good effect of expensive teaching and equipment, but gives rise to bodily ills far more serious and costly than most of us appreciate.

No matter how clever the instruction or how elaborate the outfit, it is impossible for class or teacher to make good progress under the deadening influence of bad ventilation. The brain and other organs of the body are as incapable of prompt, vigorous activity without a generous supply of oxygen as the smouldering fire of a blacksmith. Power in both cases is a matter of chemical reaction. Force a draft through the coals, and the forge kindles into action. Open the windows of a stuffy classroom and in half a minute the pupils feel and look like another race of beings.

Nothing contributes more toward brightening and invigorating school work than a little fresh air now and then. But a little now and then is a niggardly allowance compared with what there ought to be. For real safety and efficiency the supply needs to be limitless all the time.

No demonstration of this could be clearer than the modern cure for tuberculosis. Thousands of patients, who would have died under ordinary conditions, have adopted a life in the open air—living out of doors, or at least keeping their windows open night and day—and they have so far improved their general health as not only to be able to check the disease, but entirely to outgrow it.

The Dangers of Bad Air.

These cures have been an object lesson on fresh air that all of us would do well to follow. Tuberculosis is responsible for from fifteen to twenty-five per cent of the deaths in our country. The main cause is generally admitted to be bad air. According to the latest United States census, the mortality from this disease among teachers is twenty per cent greater than the average in other occupations. This ought to furnish an inkling as to what conditions are in the average schoolhouse. The remedy is obvious.

We rightly condemn inspectors who take chances with dangerous exits or faulty life-preservers. When a crowd drowns or burns to death, it is apparent that something is the matter. But when the same number drop off quietly one at a time, in their own homes, the negligence is not so evident, and the rest of the world, as a rule, have always shown a cattle-like indifference.

In spite of the fact, however, that obituaries in fine print have not been able to hold their own with the screeching headlines, the general public is slowly waking to the fact that unsanitary conditions may be fully as perilous as fire-traps and collisions. A few feeble steps have already been taken in the right direction. Some of the modern city schoolhouses have excellent provision for cleanliness and ventilation. A good many teachers in other places are doing what they can to keep the children from dying on the premises. But an immense amount still remains to be done to make the situation even tolerable—especially in the country—and it is with the hope of contributing something practical to the solution of the problem that these plans and descriptions have been presented.

Rural Neglect of Ventilation.

Nobody who has ever spent a winter morning in a typical rural schoolhouse is likely to forget the experience. The room is generally small, low-posted and drafty. A big wood stove in one corner furnishes the heat. In cold weather the teacher, or some boy in the neighborhood, builds a huge fire just before school begins. The stove is heaped with wood and in a few minutes the upper part of the room becomes so hot that the paint smokes and blisters on the ceiling, while the layer along the floor—renewed,

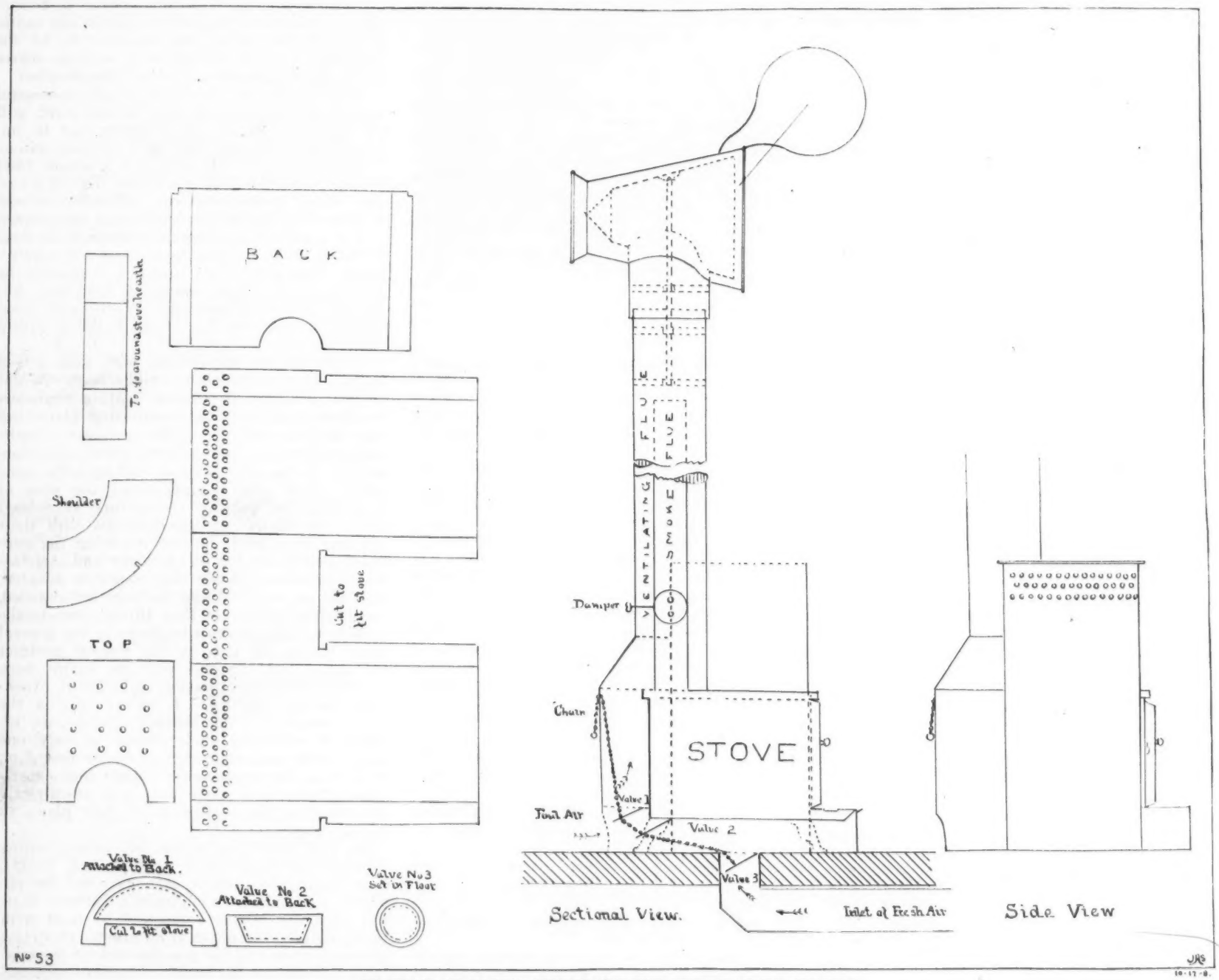


DIAGRAM OF PARTS NECESSARY FOR VENTILATING SYSTEM.

perhaps, from the cracks around doors and windows—remains as cold and uncomfortable as ever. The pupils near the stove sit under a direct blast of radiated heat. The ones farther away shiver in their coats and mufflers and amuse themselves by blowing clouds into the curious layers of cold air around them, or beg for a chance to change seats with somebody nearer the fire.

From the time the windows are closed in the fall till they can be opened again in the spring, there is no provision for changing the air. In the superstitious past some mysterious flue and register may have been erected in honor of an unknown deity, but, open or closed, it makes little difference, for nothing but rats ever go out of it.

Where such heating and ventilation prevail and where frequent bathing and change of clothing are none too carefully attended to, it is not surprising that the membership should fall off seriously during the winter months, and that those who do come, teacher and pupils, should be able to accomplish only a small part of what they might, if they could only keep in proper physical and mental condition for work.

A Simple Remedy.

The whole situation in any one-room schoolhouse can be permanently changed for a trifle. A jacketed stove and outfit, first adopted by Supt. Howard of Northfield, Mass., solves the problem of fresh air and equal heating, and it can be made and installed anywhere by a capable tinsmith. The outfit is cheap, easy to run, saving of fuel, works summer and winter. The apparatus consists of a stove—the one already in use will do—a galvanized iron jacket, an inlet pipe, an outlet pipe through the roof, and one of the new automatic wind pumps on top.

The plan is to bring fresh air from outdoors through the flue under the floor, pass it over the stove inside the jacket, and out into the room. At the same time heat from the back of the stove and the stove pipe lifts the air in the ventilating flue, and with the help of the wind pump outside draws foul air from the floor and removes it. A set of valves controlled by a chain is used to close the outside pipes, open a passage into the jacket and so keep circulation within the building at night or when the fire is being started in the morning.

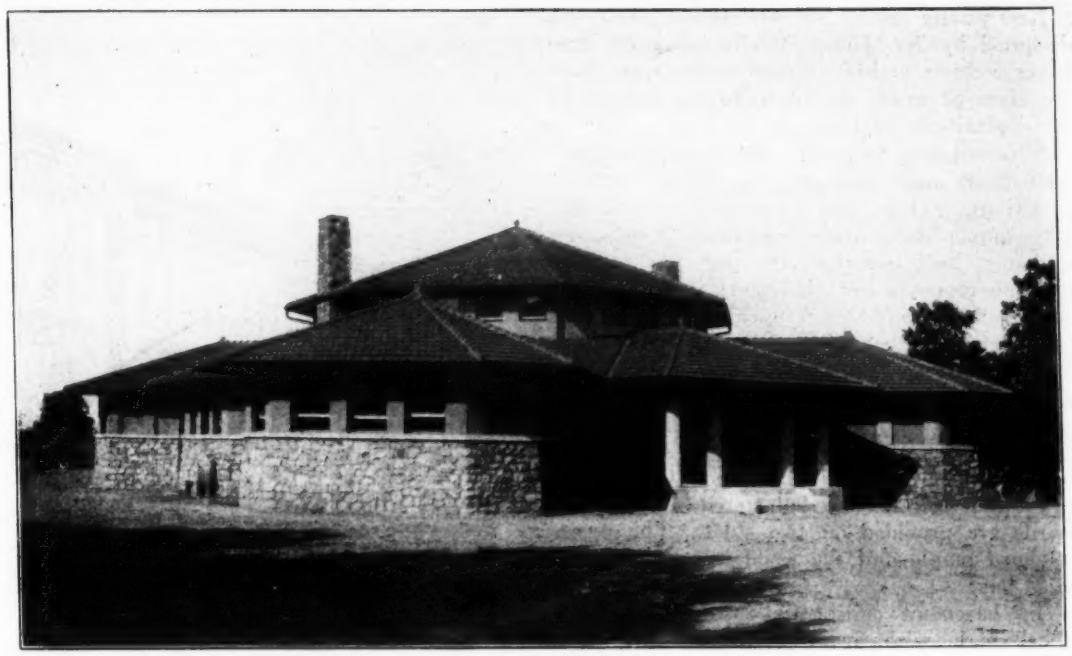
The inlet flue can be a large tin or galvanized pipe or even a wooden box built onto the floor. It should be screened outside, and run far enough up the building so that the opening will not be covered with snow from the eaves.

The jacket is of sheet metal; the form, of course, depending upon the shape of the stove used. The one shown in the drawing is for an old fashioned box wood stove, and is so constructed that the door projects beyond the jacket. A cylindrical coal stove would be entirely covered with the jacket, and a large door would be needed in front to use for the fuel and ashes.

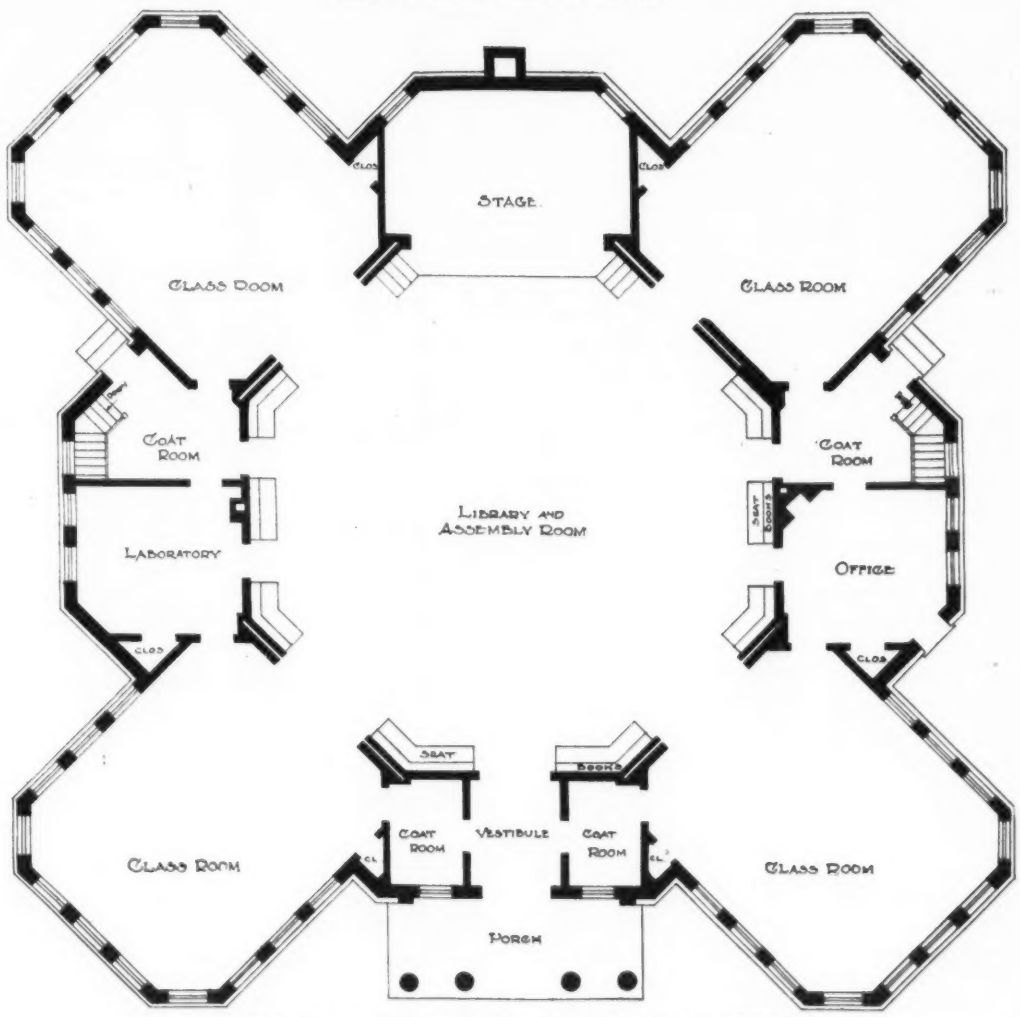
The Jacket and Air Pump.

The purpose of the jacket is to create a strong draft of fresh air and prevent direct radiation. The jacket has a cover and both cover and sides are perforated with large holes. These cause the air from the jacket to mix with the cooler air in the upper part of the room and so prevent the hot air rising in a scorching blast, and wasting a good part of its heat on the ceiling. The heat gained in this way more than compensates for the heat taken from the back of the stove and the stove pipe to use for stack heating.

The stack heating is accomplished by having the outlet pipe cover the back of the stove and the smoke-flue. The chimney is entirely done away with. The smoke-flue is tile or stove pipe, held firm by wires inside the ventilating flue.



NEW HIGH SCHOOL, BETHEL TOWNSHIP, OHIO.
Charles Insco Williams, Architect, Dayton, Ohio.
Cost, $12,000. Built of field stone and brick, cement plastered outside, tile roof. A good example of fire-safe building that is not fire-proof.



FLOOR PLAN, NEW BETHEL TOWNSHIP HIGH SCHOOL.

This source alone furnishes fair ventilation, as good as can ever be secured by the stack-heating principle. But the stack-heater is not sufficient, especially when the wind happens to be contrary. Stack heaters help, but to move the great weight of air in the room the power needs to be applied directly. The only convenient apparatus for the country is the air pump. This is so constructed that it always faces the wind and uses the motion of the air to produce suction after somewhat the same principle of the steam injector. The air pump is perhaps the most expensive part of the outfit, but its work justifies its cost.

The shape and arrangement of valves and other parts is made clear by the diagram. On the valves the points where the chain is fastened ought to be equidistant from the hinges. The weight of the valves swings them into position, so the heavier they are made the better. The nearer the stove is to the center of the room the better.

A coat of fireproof paint over the iron inside the room will add considerable to its appearance. The floor under the stove must be protected from too much heat. Police regulation in some places may require that the outlet flue be surrounded with asbestos sheeting where it passes through the ceiling and roof, but there is small chance that the heat in this flue could ever be great enough to cause danger.

There is no problem in construction but what any intelligent workman will be able to work

(Concluded on Page 25)

PUBLIC SCHOOL 44.

New public school No. 44, Indianapolis, was designed by Mr. Henry C. Brubaker of Brubaker & Stern, and is a complete departure from the class of grade school buildings erected in the capital city of Indiana.

It is entirely fireproof, with reinforced concrete floors and stairways, and terra cotta wall partitions. There are nine class rooms, for fifty pupils each, three recitation rooms, an assembly hall, seating 500 persons, manual training rooms, a branch library, teachers' and principal's rooms.

The building has three exits and two eight-foot stairways. The corridors are sixteen feet wide, with terrazzo floors, and cement wainscoting four feet high.

The class rooms are 24 by 32 feet in size and have ceilings 12 feet 8 inches high. Class room walls and ceilings are plastered and blackboards are provided on two sides. The floors are hard maple and the wood trim is mission finish oak.

The basement ceiling is eleven feet eight inches high, with five-foot windows, the first floor being eight feet above grade.

The heating and ventilating system is a direct-indirect gravity steam plant, guaranteed to change the air every twenty minutes in each room.

A NEW GRAMMAR SCHOOL BUILDING AT LIMA, OHIO.

The new grammar school building at Lima, Ohio, was designed to meet with the new code adopted by the Bureau of Inspection of Workshops and Factories of the state of Ohio, which controls the erection and construction of school buildings in the Buckeye state.

The new code, adopted since the Collinwood fire, requires that all buildings built semi-fireproof, or such as are commonly built with incombustible walls and roof materials, with windows, doors and floors of wood, must have two separate and distinct means of egress from each school room, play and toilet rooms. One-half of the exits shall lead to the main corridors and the other half to fire escapes or inclosed fireproof stairways.

All floors over boiler or furnace rooms are to be made of fireproof material, and no wood is allowed in the construction of floors over same, except that finished floors of wood may be used on top of the fireproof material.

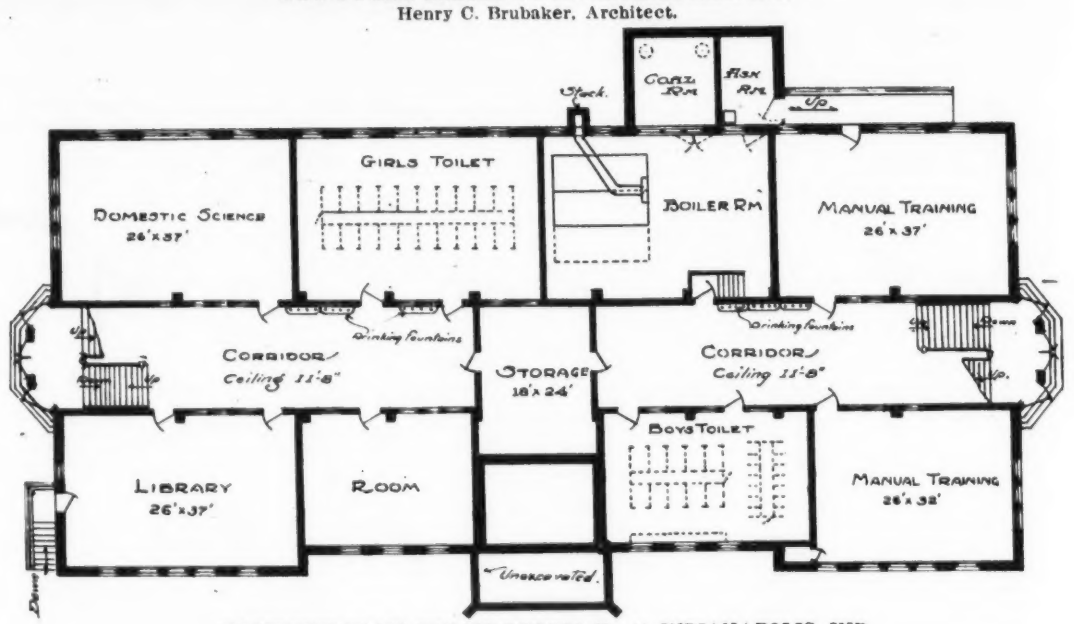
In designing a building the architect keeps in mind the treatment of the exterior, as well as the interior arrangement. The reader may conceive what great fears and doubts the delineator of this building may have had when confronted with the idea of using the unsightly fire escapes of iron, placed promiscuously around the building on the outside, destroying all symmetry and artistic lines. The thought occurred to him: "What can be done with the clause, 'or inclosed fireproof stairways,' in the new *code*?"

The fruits of the idea for an enclosed stairway from each room, as shown in above arrangement, accomplishes the requirements for a fireproof stairway and exit from each room on each floor, and from the basement, besides keeping the architectural effect of the building, and giving a safe, secure and effective exit from any part of the building in case of a panic.

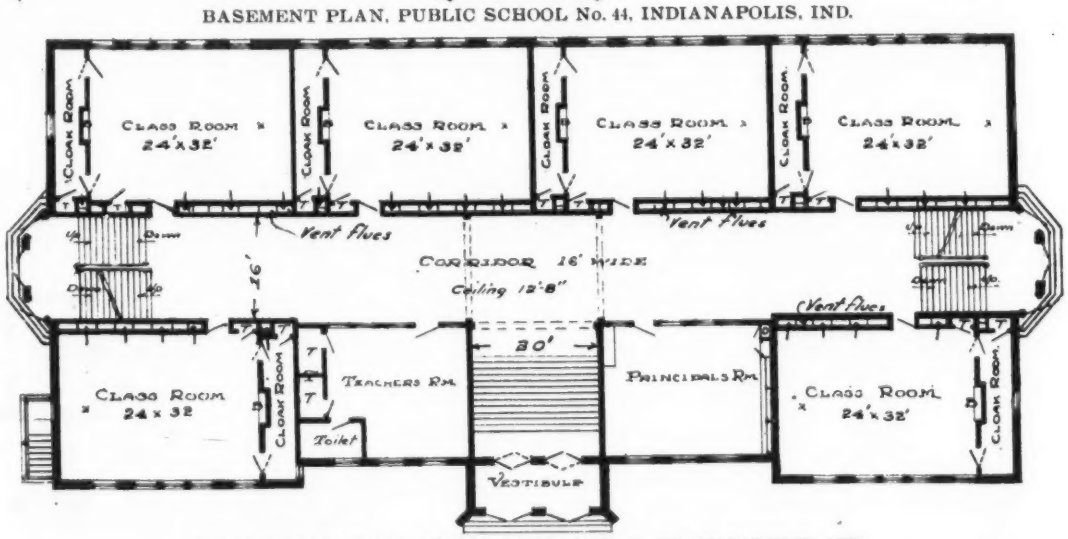
The building as planned shows an ideal arrangement of enclosed fireproof stairways, without entrances, having concrete floors and ceilings, and stairs built of metal.

The extra cost to buildings thus equipped and constructed, is an insignificant item considering the dangers of ice-covered exterior stairs commonly put up for fire protection, as against the permanent stairs placed inside of the walls. This arrangement allows the teachers and pupils of each individual room a free exit and escape from the crush of a panic.

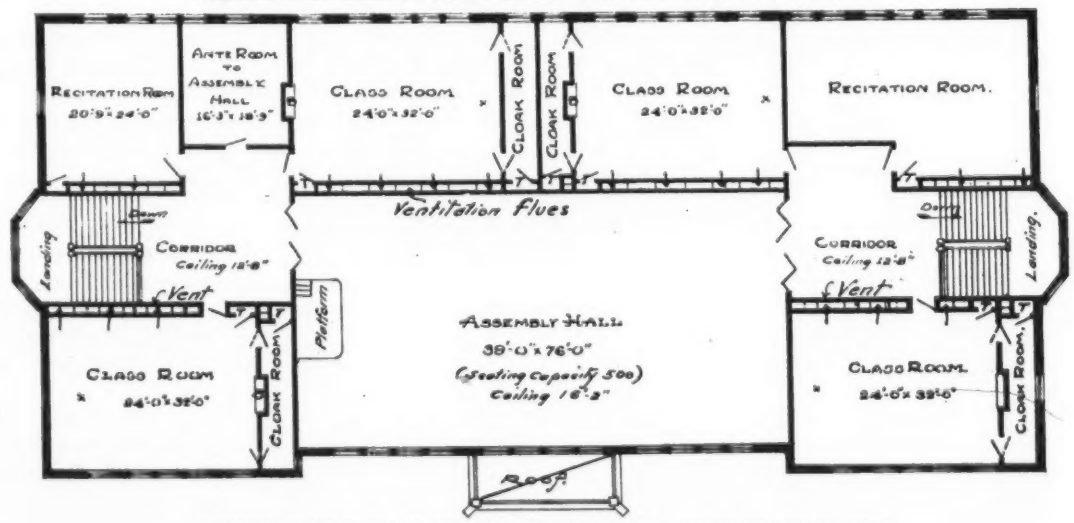
NEW PUBLIC SCHOOL No. 44, INDIANAPOLIS, IND.
Henry C. Brubaker, Architect.



BASEMENT PLAN, PUBLIC SCHOOL No. 44, INDIANAPOLIS, IND.



FIRST FLOOR PLAN, PUBLIC SCHOOL No. 44, INDIANAPOLIS, IND.



SECOND FLOOR PLAN, PUBLIC SCHOOL No. 44, INDIANAPOLIS, IND.

The enclosed stairs further give the pupils a sense of absolute safety and confidence, and free them from the fear which a great many children, as well as adults, have of the seemingly insecure and open latticed fire escapes. The inside stairs can be made plain or ornamental, as circumstances will permit.

This building combines all of the modern conveniences used in school house construction, using re-enforced concrete floors in corridors on first floor, to fireproof the same from the furnaces or boilers located in the basement.

The walls are all of brick construction and exterior walls are veneered with a brown press brick. The foundation above grade line, and all trimmings, are of Bedford stone. The roof is covered with red tile. Sanitary construction for the interior is given careful attention, as well as sanitary plumbing and toilet fixtures.

All rooms are heated and ventilated and the heat is regulated by "temperature control" apparatus. Inside finish is of golden oak and walls are tinted with waterproof colors.

The character of the architecture of the building throughout is of pleasing effect, as nothing but plain trimmings and details were used. The general arrangement of the windows, the heights of walls and elevations, give the building a character that appeals to all for its beauty and simplicity, appearance of durability and freedom from costly ornamentation.

This building was designed by Leech & Leech, architects, of Lima, Ohio, who have made schoolhouse architecture a study, keeping abreast with the times in this class of work, as may be attested by the amount of schoolhouse work commissioned them in their section of the country.

WASHINGTON MODEL SCHOOL.

Page 17.

The model Washington rural school house was designed about one year ago for the state school department by Mr. Frederick Heath of Tacoma. A considerable number of structures have been erected from the design and are giving perfect satisfaction.

The design calls for a building 40 by 26 feet in dimensions, with a vestibule 7 by 8 feet. The footings and foundation walls are of concrete, plastered on the outside with cement mortar. The framing lumber is common fir in the following dimensions:

Floor joists .....2x12 inches, 16-inch centers
Ceiling joists .....2x12 inches, 16-inch centers
Studs .....2x 4 inches, 16-inch centers
Rafters .....2x 6 inches, 20-inch centers

The exterior is faced with cedar siding; the roof is shingled.

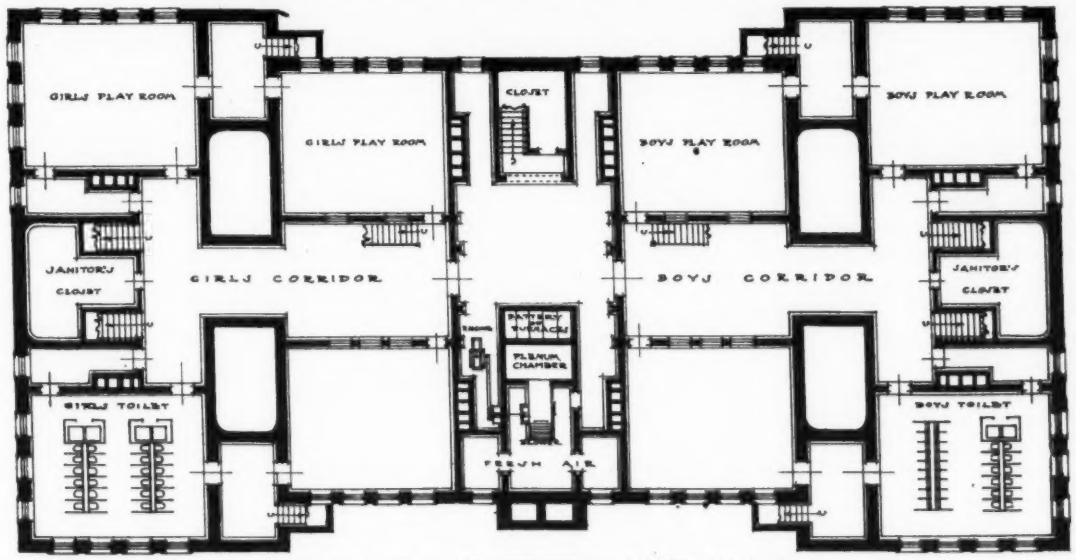
The class room is 25 by 32 feet 6 inches in size, plastered, with fir doors and wood trim in natural finish, and natural slate blackboards.

The heater is set in a brick compartment near the entrance. Air for ventilation is taken in at a height of about nine feet above the ground, drawn down under the stove and discharged into the class room through the register at about eight feet above the floor level. The vitiated air is drawn into the cloak room and through a register on the floor line up the chimney. The latter is heated by the steel smoke pipe of the stove.

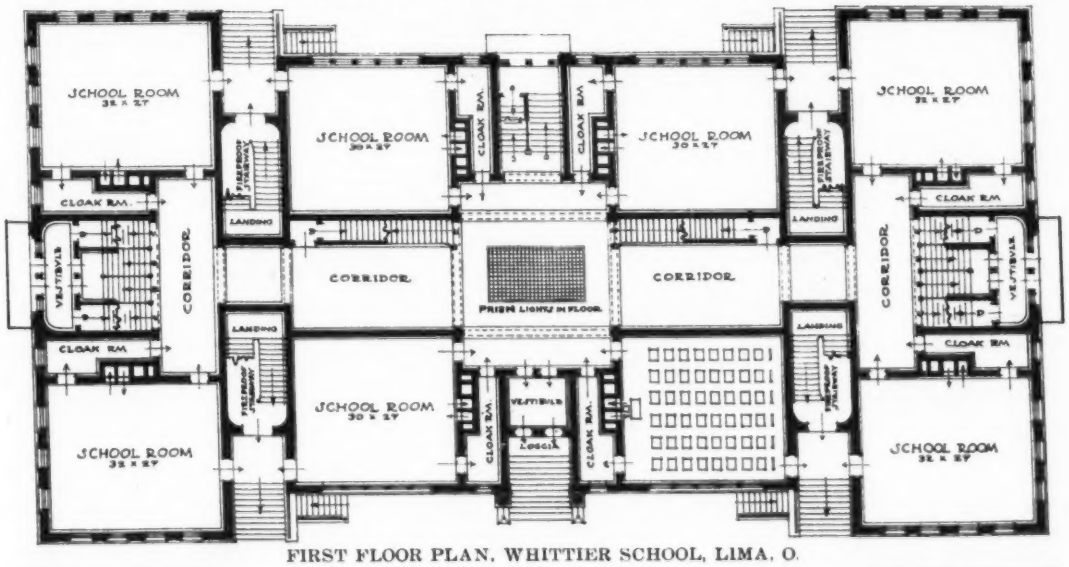
Philadelphia, Pa. Sixty playgrounds for children are to be conducted by the board of education during the summer months. The number is the largest in the history of the work.

Hon. Charles W. Gordon has been elected president of the St. Paul board of school inspectors. He succeeds Dr. Christian Fry, who had been ousted by the mayor because of absence from the city.

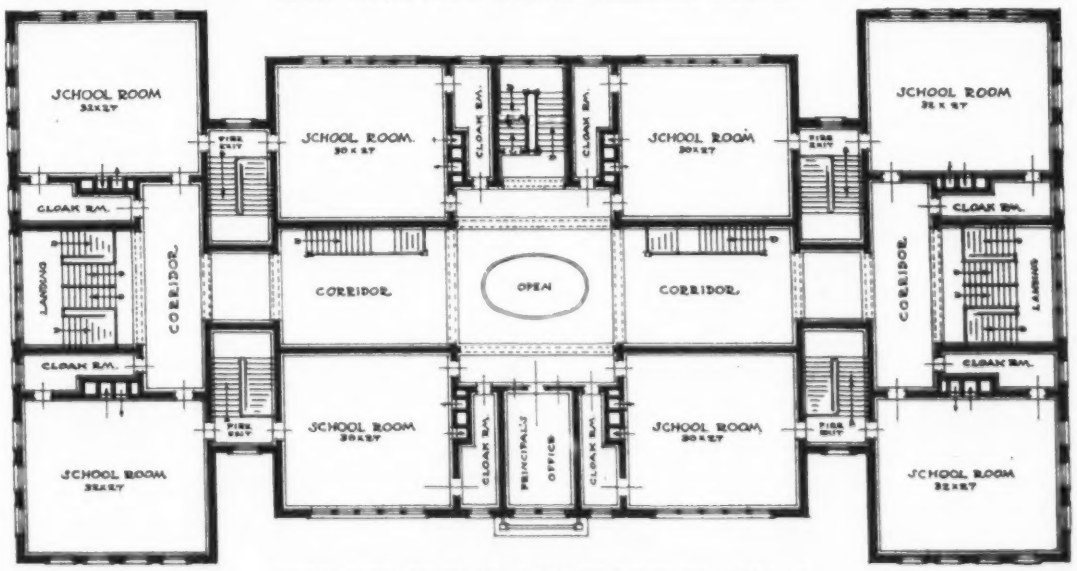
THE WHITTIER SCHOOL, LIMA, O.
Leech & Leech, Architects.
Built according to the requirements of the new Ohio code, with a separate fire-proof exit from each room.



BASEMENT PLAN, WHITTIER SCHOOL, LIMA, O.



FIRST FLOOR PLAN, WHITTIER SCHOOL, LIMA, O.



SECOND FLOOR PLAN, WHITTIER SCHOOL, LIMA, O.

"TIME."

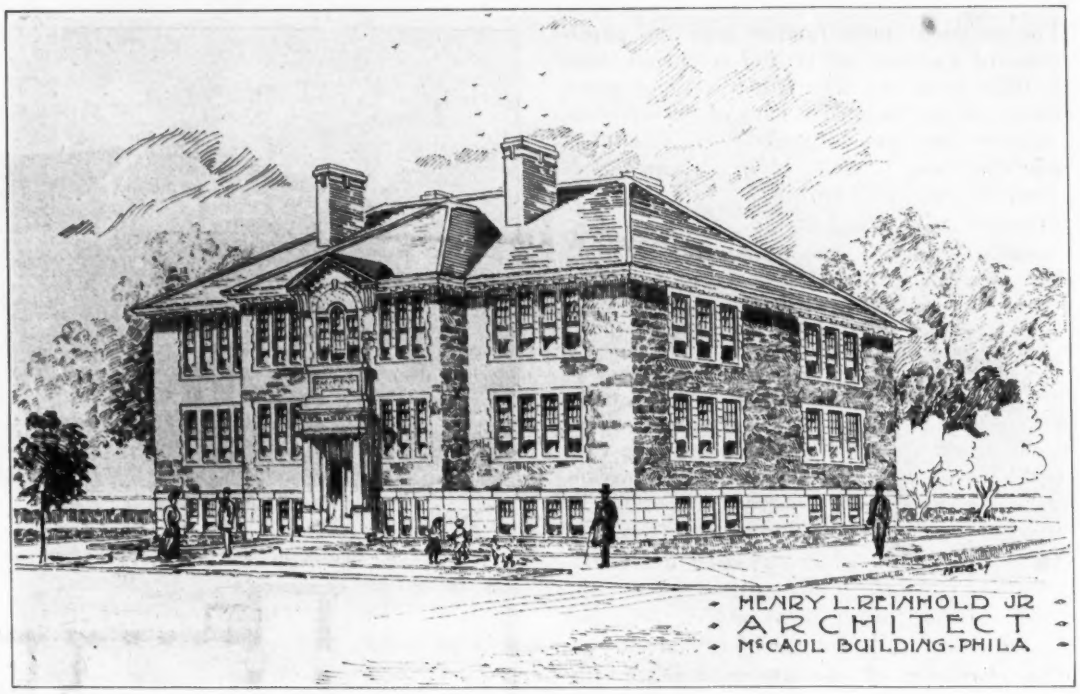
By Herbert H. Hammond.

Time is probably the most important factor in the conduct of a school as in any other line of work. But how few school boards realize this, or that a well ordered school must of necessity be on time, and uniformly so in all departments; if classes move at the expiration of each period, that all must start at exactly the same instant to avoid waiting and confusion; that opening and closing hours and recesses must be accurately marked by bell signals. In order to do his best work, the teacher should be relieved of all care and anxiety as to the passing of time, knowing that a bell signal will be given at the proper moment and that the electric clock on the wall in his room will agree with the bell when it rings. These conditions render it possible for him to give his deepest thought and most intelligent effort to his class. The very best that is in him is given to his scholars, and educational work receives an uplift that is possible in no other way.

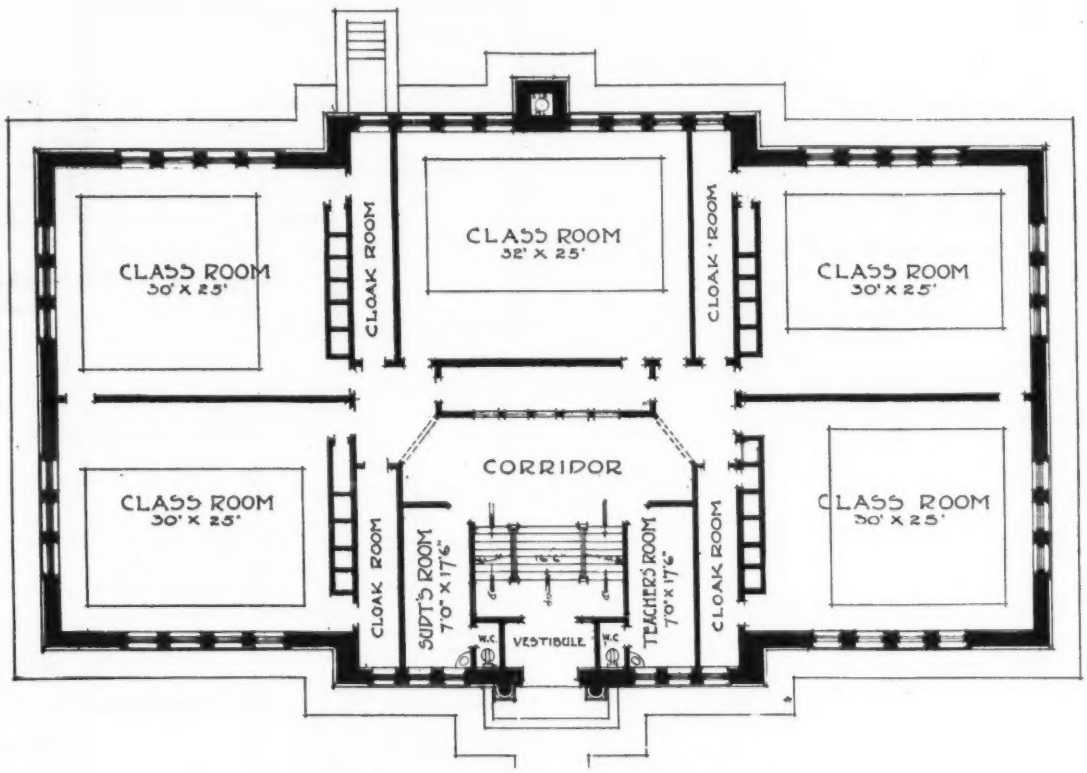
Boards of education should appreciate this; it should be borne in upon them, the importance of making a study of the great need of providing furnishings and apparatus to bring school work up to its highest efficiency. If a teacher must keep his mind occupied with the many little details incident to the conduct of the school, he must of necessity fall just that much short in the real educational work. He should be relieved of every detail that can be taken care of automatically, and just here is where an electric clock and program bell system fits in. No high or grammer school is properly furnished that is without one, and it should be complete and up-to-date.

Then, too, there should be care taken in the purchase of such a system, and parties offering to install alleged clock and program apparatus at prices inconsistent with the cost of production plus a fair margin of profit should be regarded with suspicion. Many cities have been badly victimized with cheap clock systems where the boards or commissions, having the matter in hand, have congratulated themselves upon saving a good sum—hundreds of dollars it may be—in the purchase, only to realize later that they have really bought a large annual bill of expense, and this bill will grow and grow and be never-ending so long as the system remains. Some have had to throw them out entirely and replace them with a system costing more in the intial investment, but having the advantage of reliability and an inexpensive maintenance charge. No economy here, is there? The cheapest is seldom the best in any line and *never* so in clocks. School authorities not engaged in the actual educational work are apt to regard such matters with a degree of indifference and not infrequently will be found saying that "any old clock will do," and "Oh! the bells can be rung by hand all right," or they will ask some poor cringing principal who may be excellent as an educator, but lacking the courage of his convictions and desiring to please his masters, if he cannot "get along without it." Why, yes, *of course* he can, and he *could* "get along without" *any* of the modern improvements put into the building; without the architectural embellishments outside and inside; in fact, he could "get along" in the old shack from which he recently so proudly moved into the new building.

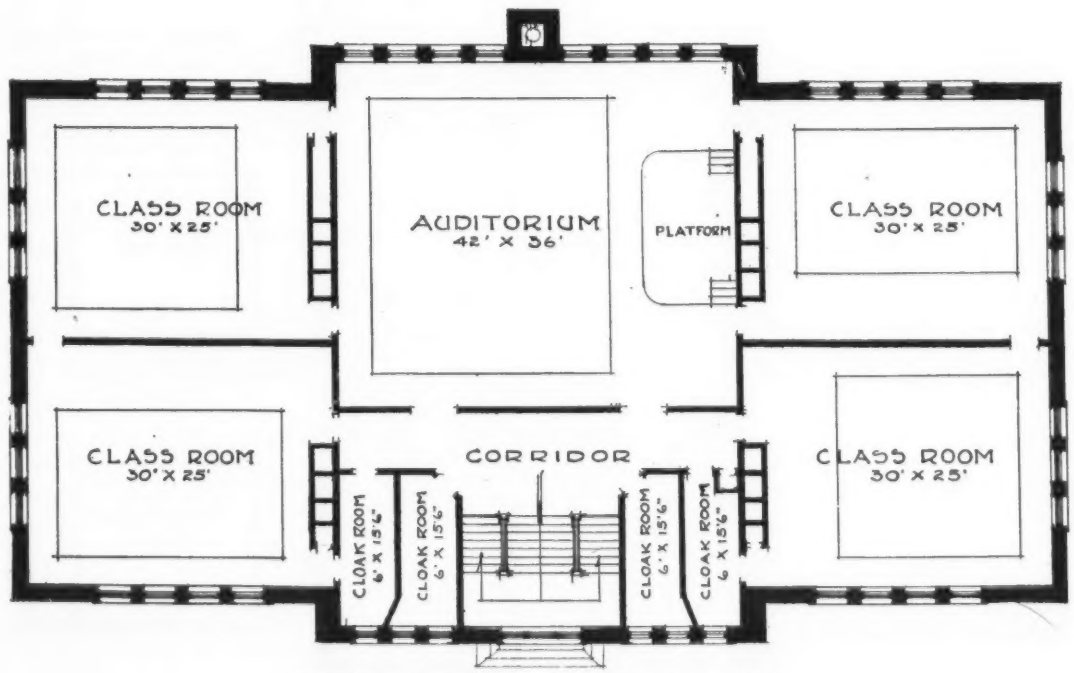
Where a board falls into the "can't you get along" habit merely for the sake of completing their building within the appropriation, or being able to boast that they had money left, it is time to look for "politics in the board," and also for a new board that will be composed of men who will study the real needs of their children and their children's teachers, regardless of a few paltry dollars saved to the poor taxpayers.



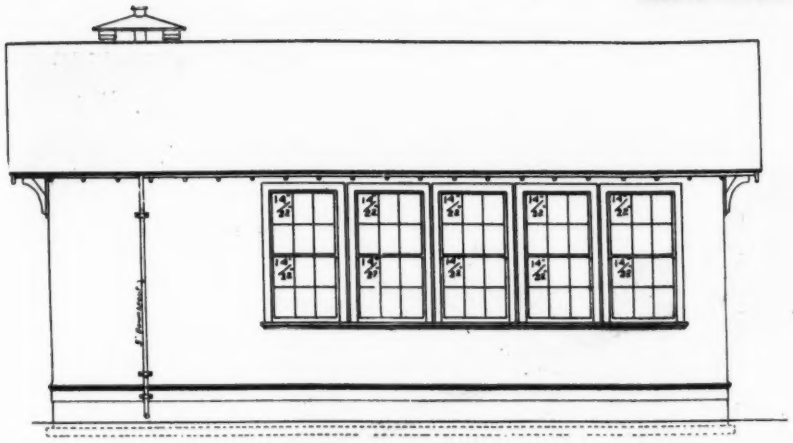
NEW PUBLIC SCHOOL, GARRETTFORD, PA.
Cost, $25,000. Mr. Henry Reinhold, Architect, Philadelphia, Pa.



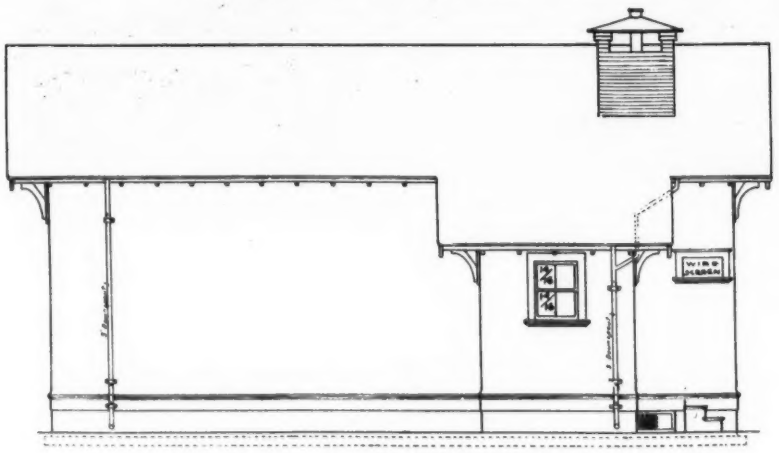
FIRST FLOOR PLAN, GARRETTFORD SCHOOL.


CLASS ROOM 30' X 25'
AUDITORIUM 42' X 36'
PLATFORM
CLASS ROOM 30' X 25'
CLASS ROOM 30' X 25'
CORRIDOR
CLOAK ROOM 6' X 15'6"
CLOAK ROOM 6' X 15'6"
CLOAK ROOM 6' X 15'6"
CLOAK ROOM 6' X 15'6"
CLASS ROOM 30' X 25'

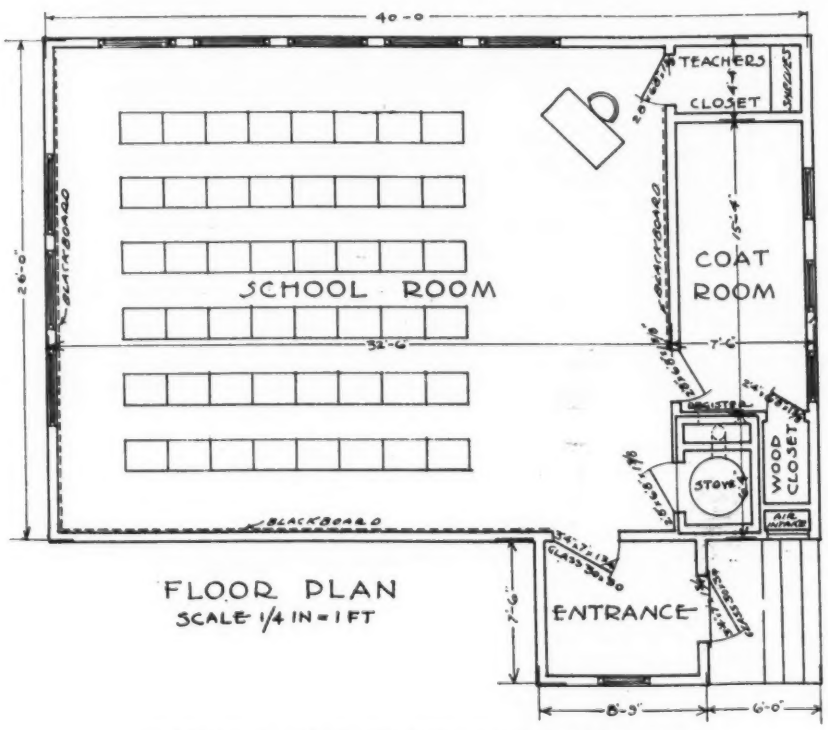
SECOND FLOOR PLAN, GARRETTFORD SCHOOL.



SIDE ELEVATION, MODEL WASHINGTON RURAL SCHOOL
Frederick Heath, Architect, Tacoma, Wash.



SIDE ELEVATION, WASHINGTON RURAL SCHOOL.

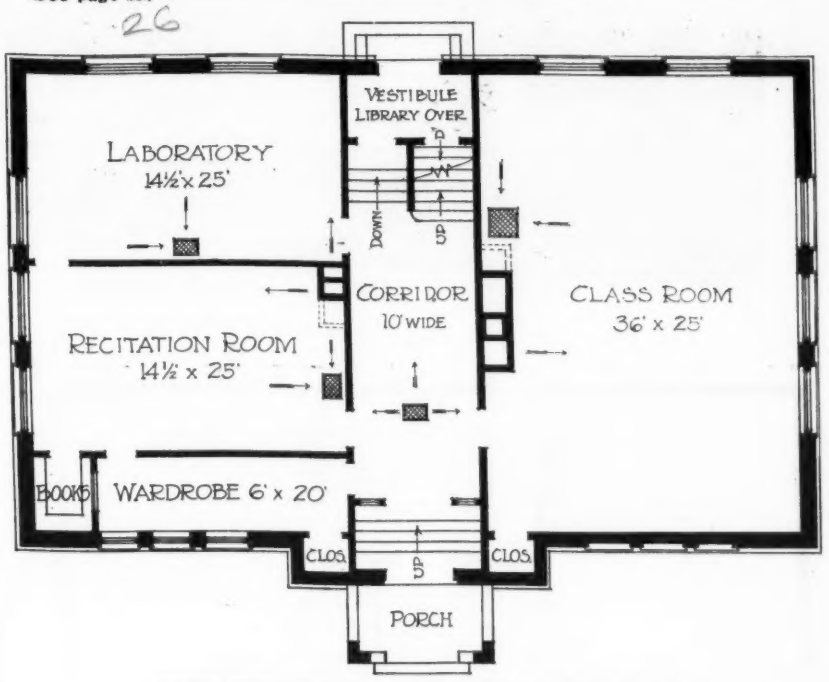


FLOOR PLAN, MODEL WASHINGTON RURAL SCHOOL.
Prepared for State Supt. R. B. Bryan, by Archt. Frederick Heath. (See page 26.)

SIDE ELEVATION, MODEL WISCONSIN RURAL SCHOOL.
Prepared for State Supt. C. P. Cary, by Archt. P. M. Christiansen, Milwaukee.

DISTRICT HIGH SCHOOL, TUCKAHOE, N. J.

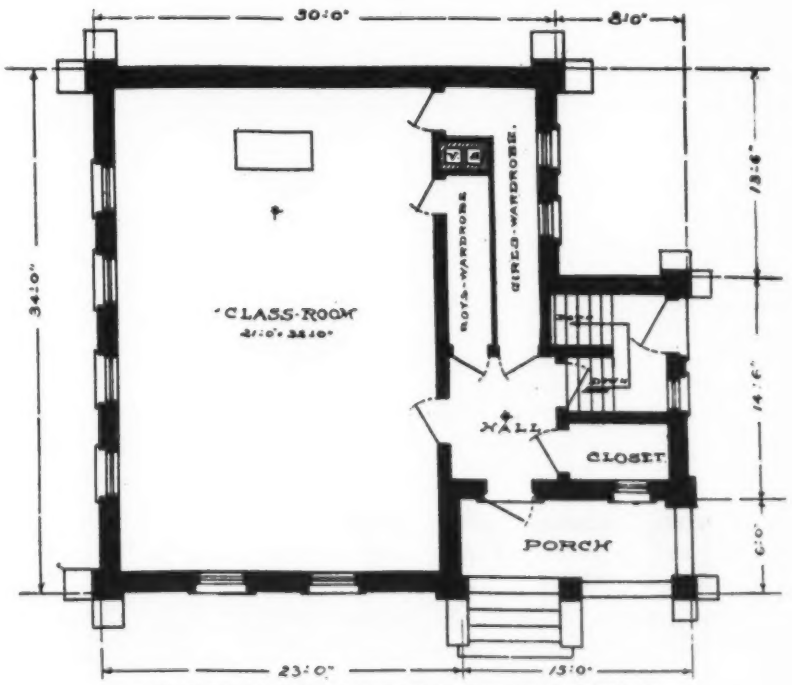
(See page ~~21.~~ 26)



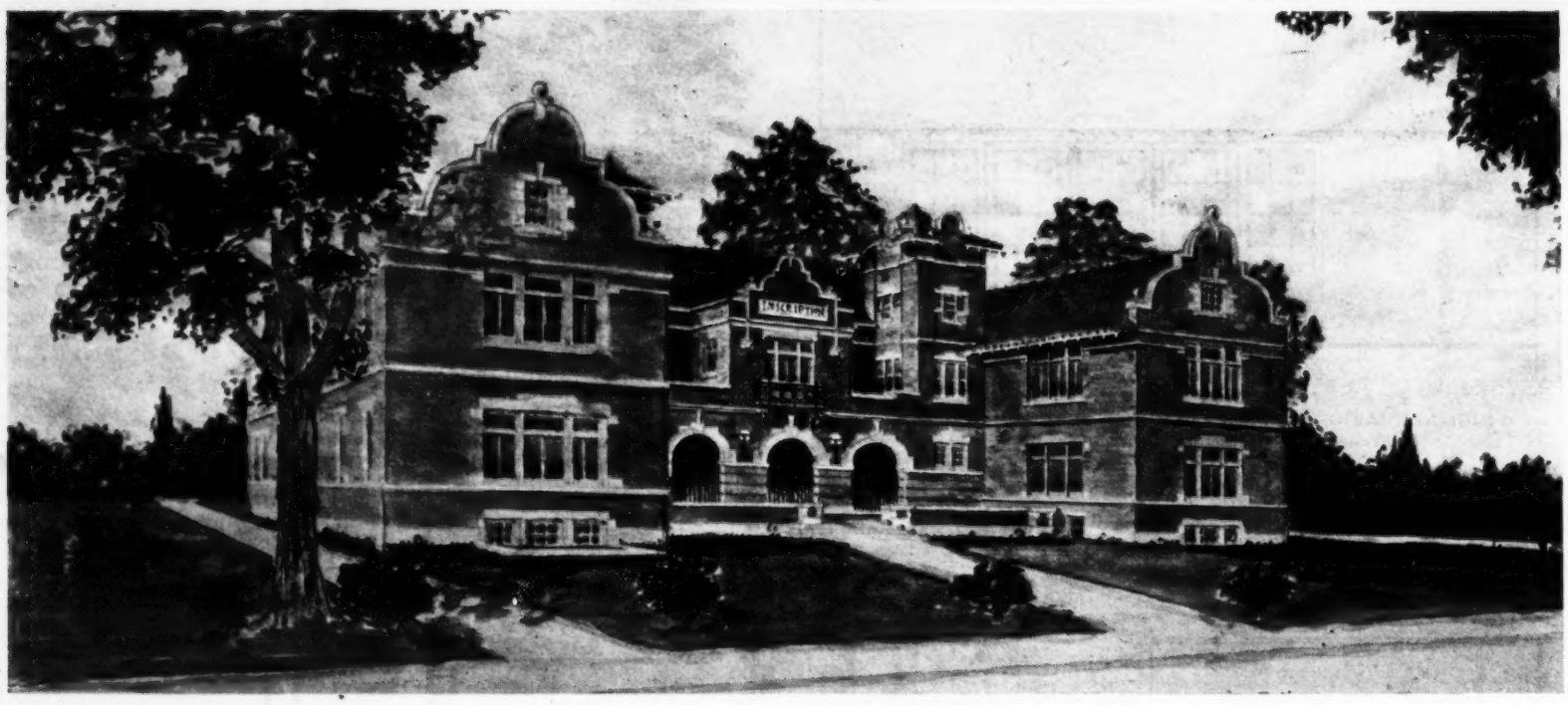
TUCKAHOE DISTRICT HIGH SCHOOL, FLOOR PLAN.

FRONT-ELEVATION

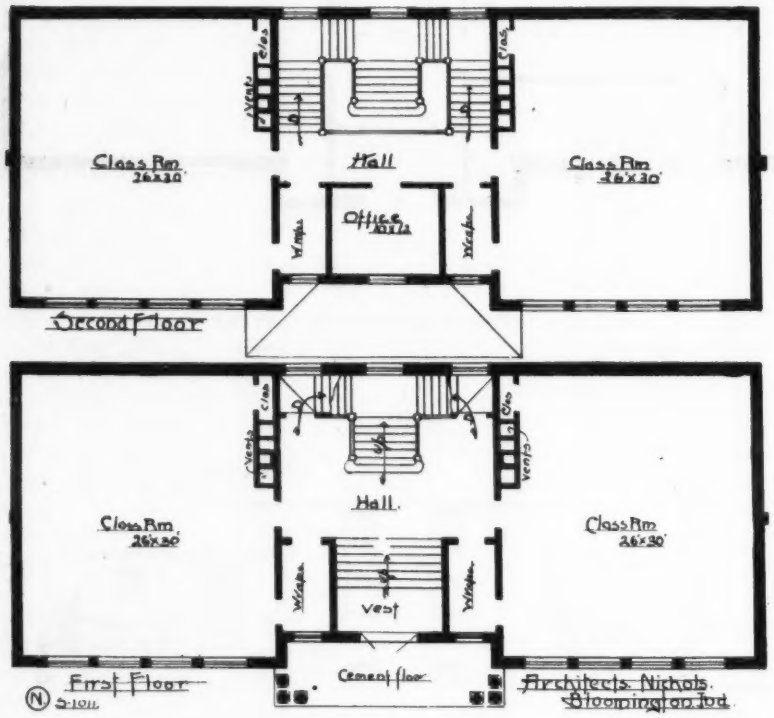
WISCONSIN MODEL RURAL SCHOOL.

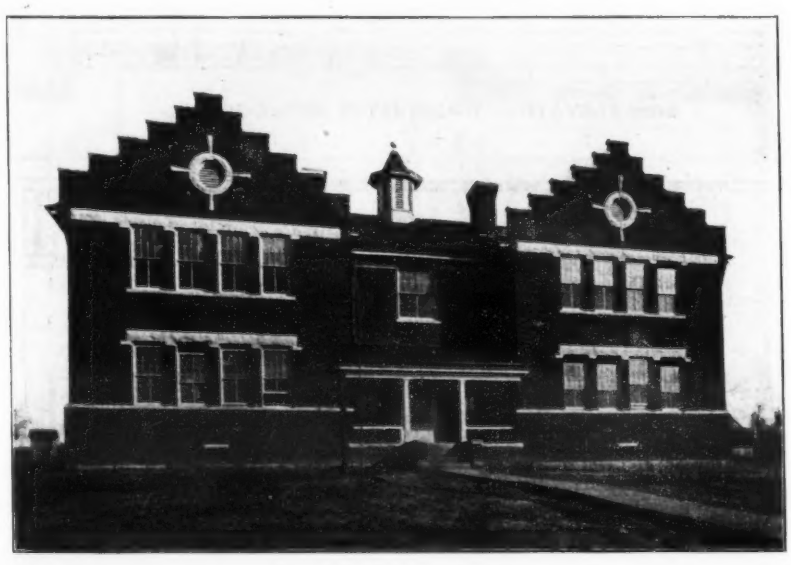


FLOOR PLAN, WISCONSIN MODEL RURAL SCHOOL.



MODEL DESIGN FOR SOUTHERN SCHOOL BUILDING.
Robinson & Reidy, Architects, St. Augustine, Fla.





NEW SCHOOL, SMITHVILLE, IND.
Architects Nichols, Designers, Bloomington, Ind.

BUSY SUPERINTENDENTS.

Providence, R. I. Wesleyan University has decided to discontinue the co-education of boys and girls in the same classes, but has not determined whether a separate college for women shall be established. It is believed, however, that such a course will be adopted if the money can be raised.

Supt. Burton E. Nelson of Racine, Wis., has been re-elected, with a salary increase of $200.

Supt. Gerard T. Smith of Peoria has been elected president of the City Superintendents' Association of Illinois, a new organization formed at the national convention of superintendents in Chicago. The association will meet at Springfield once each year, on the afternoon before the opening of the annual meeting of the state teachers' association. The following officers were elected: Vice president, J. G. Moore, Lexington; secretary, R. G. Jones, Kewanee; treasurer, W. S. Booth, Mt. Carmel.

The Florida School Exponent has been sold by A. A. Murphree, Tallahassee, to Miss Hattie Carpenter of Miami, who will issue the publication from the latter place. Miss Carpenter has been a leader in educational circles of her state for a number of years, and is well qualified for her new duties by long experience in teaching and in newspaper work.

Chicago, Ill. The Chicago Principals' Club has recommended the following five names to the board of education as eligibles for the Chicago school superintendency:

James E. Armstrong, Englewood High School.

Mrs. Ella Flagg Young, Chicago Normal School.

William J. Bartholf, Von Humboldt School.

Henry C. Cox, district superintendent.

William M. Roberts, assistant superintendent.

The New York City board of education has turned down a plan for single sessions in grades one and two of the elementary schools. This contemplated three and one-half hour sessions in the morning and the same in the afternoon, one teacher thus taking charge of two classes. The board of superintendents reported that this would simply make "part-time classes" universal in the city, and in no way relieve the overcrowded situation.

Burlington, Vt. The school board has forbidden students in the high schools to continue their memberships in secret societies under pain of expulsion. Four such organizations flourished in the school.

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Address Dept. M.
AMERICAN SCHOOL BOARD JOURNAL, Milwaukee, Wis.

We want one or two active, energetic teachers or superintendents to represent us this summer with a view to permanent position in the sale of Webster's Universal Dictionary, June, 1909, edition.

This work is highly recommended by a large number of State superintendents.

It is now recommended for purchase in many State library bulletins.

We, also, have an entirely new series of abridgments based on Webster's Universal which have recently been adopted in many cities.

For full particulars address the
SAALFIELD PUBLISHING CO.,
Akron, Ohio.

INDUSTRIAL TRAINING IN GRAMMAR SCHOOLS.

By Supt. Alfred C. Thompson, Auburn, N. Y.

Plans for reorganizing the public school system from top to bottom so as to lay a more practical foundation for the industrial life in which the great majority of pupils will find their vocation are everywhere in the air.

The apprenticeship system under which workmen were formerly trained for their vocations has practically disappeared. The result is that most of the higher paid artisans come to use from abroad and our own children under the present factory system do not learn complete trades but perform one mechanical, senseless, unrelated single process in the productive industries.

Formerly, when a substantial part of our population was in the country, boys received instruction in nearly every trade that contributed any article needed in the home or about the farm. They learned something of agriculture, carpentry, masonry, blacksmithing, painting, harnessmaking, etc., and the girls were instructed in the household arts. President G. Stanley Hall says that boys brought up on a farm a generation ago were taught the rudiments of at least seventy trades.

Now a large majority of the children are in the cities and villages. Few of them are given any responsibilities or duties to perform at home, consequently in the interest of industrial progress it is clearly the duty of the school to give a manual education which shall be most effective to this end, and since a very large percentage of the children never reach the high school this education must begin in the elementary grades.

Vocational or Educational Manual Training?

Just the character of manual education which will best accomplish the desired purpose has not been demonstrated. According to the most reliable statistics available, there are 477 recognized occupations in this country. All but seven of these are engaged in by women. I know of no way to determine how many distinct vocations there are.

One of the principal industries of my city is the manufacture of shoes. I have learned that in the making of a shoe there are from sixty to one hundred processes, depending upon the quality of the shoe. Each separate process is the vocation of a set of people. From my office window can be counted from thirty to fifty occupations.

If the new industrial education is to train for individual occupations then we have the problem of deciding which of the hundreds of occupations by which our people gain a living, are to be selected for specialization, for manifestly all cannot be taught. Shall the general aim of our industrial training be to teach the essential elements of all manual occupations, or to teach expertness in one special manual deterity or trade?

Is it the business of the school to teach the pupil how to make the one-hundredth part of a shoe during eight hours of the day, or to teach him how to live the other sixteen hours? This is the question squarely put.

Before we abandon the wisdom of experience in order to embrace some new form of education let us be sure that the new will tend to make a man at the same time that it trains a mechanic. In this rapidly changing age trades and machines become obsolete in a generation. After these have passed the man lives on.

In the early eighties a friend and companion of my youth announced his decision to learn the printer's trade and tried to persuade me to do the same. He argued that the demand for printing must surely increase; that the wages were good with excellent prospects of growing better, and that it would be a waste of his time to get any more general training when he could arrive at his goal so much more quickly by applying himself at once to his specialty.

After a separation of over twenty years I met this friend last summer. He was looking for a job. He told me that he had worked at his trade for nearly twenty years before it was practically obsolete; that he was too old to learn to manipulate a typesetting machine with sufficient speed and that since typesetting was the only thing he had ever learned his predicament was most unfortunate. This is a typical case. It is a concrete illustration of too early specialization. The most practical industrial education, in my opinion, is that which will teach children to think and make them versatile so that they will be able to adjust themselves to a changing environment. Any form of education, whose chief aim is to teach trades at the sacrifice of academic work, will be disappointing in its results. Of this I have no doubt.

The Child.

We must remember in planning the industrial course for grammar grades that it must be adapted to children fourteen years old and younger. Children of this age cannot tell what vocations they will follow, and neither their parents nor any one else can decide for them. In many foreign countries the child

(Concluded on Page ~~40~~ 30.)

Sweeping Schoolrooms

DUST is the means of conveying more infectious diseases that result in death to human beings than any other known medium.

Our inherited indifference to dust, from ages of ignorance as to what dust was composed of, leads the millions who are not yet informed to look upon it merely as an unavoidable nuisance.

But dust is a distinct and deadly menace to our well-being.

Under the title "A Neglected Phase of Schoolroom Sanitation," Principal R. L. Cooley, in charge of the Sixteenth District School No. 1 of Milwaukee, Wis., prepared a very interesting paper for the International Congress on Tuberculosis, held in Washington, D. C., last October.

In this paper, Mr. Cooley explains how he solved the problem of suppressing, expelling and destroying schoolroom dust.

We have since had the paper reproduced in full, and copies may be had free upon request, by those interested in cleaner school buildings.

Vacuum Cleaning for Schools

Mechanical cleaning by the vacuum method involves the following separate and distinct elements, viz.:—

1. The Vacuum Producer
2. The Dust Separators
3. The Vacuum Piping
4. The Cleaning Tools
5. The Automatic System Control

In the February number of this journal we explained something of the nature and advantages of the vacuum cleaning system for schools. In the March number we took up element No. 1, mentioned above, "The Vacuum Producer," and explained briefly what is meant by that term. Below we outline the details of element No. 2—"The Dust Separators"—and in following numbers the remaining elements will be explained.

We have prepared interesting literature on the subject of vacuum cleaning for schools, which we are pleased to send to interested inquirers.

Element 2—Dust Separators

Some means of separating the dust and dirt from the entrained air is necessary in any cleaning system, the principal and most desirable method being by means of a Centrifugal Dry Separator in which all the separation is effected in a dry state, without moving mechanism and almost without burden to the system. The dry separator we provide with our systems is phenomenal in this respect and of extremely high efficiency.

We enumerate below the principal features of construction and attainment of this type of dust separation:

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3. The separator can be located either in an extremely hot or cold place without detriment.
4. Being dry, the contents of the dust separator will not ferment.
5. Being dry, they also will not freeze or burst the dust separator.
6. No outside or separate connections whatever with or about the dust separator are required.
7. No outside force, aid or expense is involved in this method of dust separation, as is the case where water connections and water under pressure are required to aid in separation.
8. All connections with or into the separator are exceptionally easy of access, by means of our special clamp connections, each connection being in effect a union in the line.
9. The passages of the inlet, outlet and intermediate ways are of ample area, free and unobstructed in every way, there being neither water nor velocity heads nor spray heads nor other obstructions to cause loss of pressure, drop of vacuum and waste of power.
10. This dust separator comprehends and involves in its construction in the highest sense the items and elements of simplicity, durability, accessibility, ease of emptying, low power consumption, sanitation and safety.
11. The separation is accomplished absolutely without moving mechanism.
12. Its fixed and permanent parts mean fixed and permanent efficiency.
13. This type of separation adds the smallest possible burden in the shape of power required, the system being in this respect very different from the wet separator. For example: It requires from 20 to 40 per cent. of the total power of the system to effect separation, with certain wet separators.
14. With our method this action is steady and uniform, and the total capacity of the dust separator is available and acts as a vacuum reservoir.
15. The action is noiseless and automatic in every way. It requires a minimum floor space—even a large sized unit requiring not over two feet square space on the floor.
16. The dry separator requires only the ordinary attention involved in emptying same, as against the continuous attention required by the wet separator with its more or less complicated washing arrangement for the air, water and sewer connections, all of which require consideration and attendance. The wet separator processes requiring attention, being of an unpleasant nature, this daily attendance becomes extremely distasteful, tending to reflect discredit upon the whole cleaning system.
17. The dry separator is emptied and cleaned in a few minutes' time, as it requires no washing or refilling.
18. The item of expense for water used and consumed in a wet type of separator is entirely missing in this type of dry separator.

Send for literature on School Cleaning.

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SCHOOLHOUSE ACCOMMODATIONS.

(*Concluded from Page 5*)

be nearly or quite one billion dollars. But there is one offset.

We are going to equip our schools with lockers for children's books, and then we are going to use the buildings for morning, afternoon and evening classes. This movement has begun with the magnificent Charleston high school, upon Bunker Hill square in Boston, which cost, as ordinarily reckoned, six hundred dollars per pupil to be accommodated, but which by the simple device of lockers will take care of two or three times as many different pupils as do other buildings of its apparent size.

Should Visit Schools.

There are many details necessarily omitted in this paper. There are fine buildings in Boston where Mr. R. Clipston Sturgis, school architect, has done exceptionally fine work. The inventions and designs of Mr. C. B. J. Snyder, school architect in New York, are almost innumerable. No other city has so many buildings of note, such as the Morris high school and the Erasmus Hall high school. In Chicago the school architect, Mr. Dwight H. Perkins, has achieved a type of building truly representative of the place of education in a democracy. I look upon the Bernard Moos Grammar school as a rare achievement. As for St. Louis, the pioneer work of Mr. William B. Ittner, school architect, should be visited by every school superintendent, school architect and chairman of board building committee in the land. I am glad to say that there are now fine individual buildings in many other cities. It would be invidious to enumerate a few of these, however, for others equally good may doubtless be found outside of the route of my inspections. There is in Milwaukee one building that is decorated room by room more generously and tastefully than any other known to me, not excepting another famous school, that in Brookline, Mass. Both of these are elementary buildings.

I now come to my conclusion, that a railroad ticket and money for hotel bills will quickly convince the sincere searchers for the good that we are having now a genuine renaissance in schoolhouse construction and that in certain features of such construction we are now approaching standardization.

Buildings that take care of the health of the pupils and that are adequate for the accommodation of modern courses of study, trying to turn the graduate out into the world ready to do useful work in it, will be multiplied so fast in the next ten years as to surprise all, even those who make a study of school architecture, for American democracy has adopted the school as its assured salvation.

Paper read before the Congress of the American School Hygiene Association, Feburary, 1909, Chicago.

THE EFFECT OF SCHOOLROOM TEMPERATURE ON THE WORK OF PUPILS.

(*Concluded from Page 9.*)

was dull and sleepy, penmanship was poor; 75 degrees, class was dull and complained of the heat; 74 degrees, not quite so dull as above; 72 degrees, restless; 70 degrees, excellent work, cheerfulness in class; 68 degrees, best work, today seemed their best; 66 degrees, splendid work, 65 degrees, class happy and full of work, some complaint about the room's being cold; 60 degrees, too cold for good work, complained of the cold.

On the first day of the test one room was held for an hour at a temperature of 80 degrees, the second at 75 degrees and the third at 70 degrees. At the end of the hour a list of words for written spelling was given to each set of pupils, the same list to all three rooms. The average of the class on said list in the room with 80 degrees was 58.8; 75 degrees, 77; 70 degrees, 78.2. The cooler the room the better the average. The difference between 70 degrees and 80 degrees in temperature meant a difference in scholarship results of 20 per cent.

The second day all three rooms were held at 76 degrees. Another test in spelling was given. The averages were 74.5, 75.2 and 72.7. The averages were thus practically the same, there being a difference of only three per cent between the highest and the lowest per cents. The averages were not as good as those of the two rooms of the day before, having lower temperatures.

The third day all three rooms were held at 74 degrees for an hour in the forenoon. A test in spelling was given. The per cents were 78.7, 81 and 82.1. The difference between the highest and the lowest was only four per cent. The general average of all three rooms was higher than those of the preceding two days, and the temperature was lower. In the afternoon the temperature of all three rooms was 65 degrees. This was the coolest the rooms had been. The pupils are reported to have had the most energy and life. The averages were 82.7, 85.2 and 81.5. The general average of all the classes was the highest yet, and the temperature was the lowest. This last was a test in spelling just as the others had been.

Best Work at Proper Temperature.

The fourth day the three rooms were held at 68 degrees all afternoon. The pupils seemed to be at their best. Two tests were given. The first was in spelling just before recess, and the second was on a set of examples in the fundamental processes just before the close of school. With the same temperature in all three rooms, two of the classes received almost exactly the same per cents on the spelling test, while the third for a local reason fell lower. The per cents were 58.6, 72.4 and 72.3. In the second test of the afternoon the per cents were 72.7, 91 and 90.6. The per cents in two of the rooms were again almost identically the same, while the third fell below the others from another cause.

On the fifth day two tests in arithmetic were given. For an hour the rooms were held at 70 degrees. The per cents were 88.7, 83.5 and 88.4. The variation was only five per cent. In the second test the temperatures were 70, 60 and 80 degrees. The per cents were 86.1, 84.3 and 91.7. The extreme temperatures were not suitable to good work. The examples given, it developed, were too simple to entail any severe test on the classes. The examples were multiplying whole numbers of more than one digit by numbers of one digit.

The sixth day's test was another one in arithmetic. It involved work in decimals. The temperature was 72 degrees in all three rooms. The per cents were 75.8, 90.5 and 80.9. The general average of all the classes with a temperature of 72 degrees was not as high as that when the temperature of all three rooms was 70 degrees.

The seventh day involved two tests in arithmetic. The first temperature tried all around was 68 degrees, and the second 66 degrees. The averages in the first test were 86, 90 and 91.5. On the second test they were 82.3, 94.5 and 88.8. The variations in the per cents were not large. The general average of all the classes was higher at 68 degrees than at 66 degrees.

The eighth day saw the last tests. Sixty-eight degrees were tried again in all the rooms. The per cents were 68.9, 80 and 77.7. The test was in spelling. Two different sets of words were given out. On the second set the per cents were 75.5, 77.7 and 81.7. The variations in the grades were not large.

These tests were somewhat crude, and it may be claimed for them that they do not prove much. However, in a general way, they do seem to show that the best schoolroom work can be done in a temperature ranging between 65 and 70 degrees. They also show that the higher the temperature of a room is above 70 degrees, or the lower below 65 degrees, the poorer will be the work done in that room. Taken all around with right conditions as to humidity, I should judge that a temperature of 68 degrees in the schoolroom is the right temperature and that any wide variation therefrom for any considerable time is a crime against the welfare of the children committed to our care.

Tests in Underheated Rooms.

Another test of the effects of temperature was made in three third grade rooms. One of these rooms, because of a defective heating apparatus that would not do the work that was required of it and was being rebuilt, had for the period of about eight weeks a temperature that averaged 66 degrees. One of the other two rooms had an average temperature of 70 degrees, and the third one about 71 degrees. Towards the close of this period tests in arithmetic and English were given. The pupils in the coolest room received the best grades in both cases. There had been times when the one room was too cold for good work, but there never had been a time when the brains of the children were dulled because of the excessive heat. The children of the other rooms might be listless at times because of the heat. During a good part of this time the pupils in the cool room attended only a half-day, while the others attended all day. In spite of the half-days, the pupils in the cool room excelled the others who attended all day.

During the same eight weeks the building in which this cool room was located had more or less trouble on account of not being able to keep the temperature up to 70 degrees. Tests were given simultaneously in this building and two others, in the fourth, fifth and sixth grades, as well as the third. In a total of thirteen tests in four subjects the building with the lowest average temperature excelled either one or both of the others nine times.

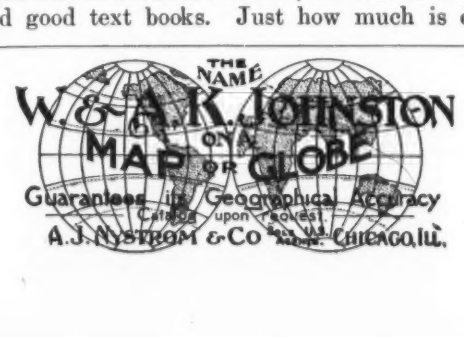
Recent tests in certain English schools showed that pupils could do good work in a temperature of 60 degrees, and that the best work was done with temperatures ranging through the sixties. The writer of this paper did not make many tests with extreme temperatures because of the danger of injury to the children. Because of poor heating apparatus, schoolrooms often range in temperature from 60 to 80 degrees. Such differences are dangerous to health. Children are frequently poorly clothed and, consequently, a little higher temperature is required. Children coming from homes that are habitually overheated also demand more heat in the schoolroom. Numerous differing conditions must be dealt with.

The wise school authorities will bend every effort towards securing for the schools under their care heating appliances that can be easily regulated or that regulate themselves. If the janitor or the teachers are to manage the amount of heat that enters a room, then the superintendent should see to it that accurate records of the temperatures are kept every day. Variations can be noted and corrections can be demanded. One of the important duties of the superintendent or school officers is to see that their buildings are not only heated, but heated properly. They can serve their patrons well by attending to this matter most faithfully during all the days of the year on which heating of the schoolrooms is required.

The results of heating schoolrooms improperly are hard to detect. They are so bound up with the results of improper ventilation that differentiation is sometimes almost impossible. But the evil effects of improper heating exist. The years develop them. In some better day conditions will be improved; knowledge will take the place of ignorance, and the schoolroom in place of being a place of danger to the youth of our land will of all places be the safest and best for not only the moral but the physical welfare of the child.

Temperature Regulation.

The efficiency of the modern school is in the main due to advance methods, efficient teaching and good text books. Just how much is due



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to environment is difficult to estimate. Healthful and cheerful schoolroom conditions are factors, however, which are recognized by all progressive school administrators. Proper lighting, adequate ventilation, temperature control and dust removal are all factors which have come to be recognized as necessities.

A poorly lighted classroom, foul air and temperature extremes have a retarding effect upon classroom labors. They affect the physical and mental condition of both teacher and pupil and reduce materially the sum total of classroom results.

There was a time when those who planned new school buildings gave no thought to equipment that would promote the health and comfort of the inmates. Now no experienced schoolhouse architect would attempt to plan a building that did not embody the recognized essentials, nor would a progressive school board omit them from its deliberations.

The question of lighting and ventilation is seldom misunderstood. Temperature regulation, it may be said, is frequently confused with the subject of ventilation, and does not always receive the attention it deserves. Ventilation deals with the infusion of fresh air into classrooms, while temperature control deals with the quality of that air.

Temperature extremes are not only harmful, but expensive. It is universally recognized that a classroom which is too hot or too cold will exert harmful effects upon its inmates. Therefore devices which will hold the temperature at an even degree—say seventy—are of immense value to the health and comfort of teachers and pupils.

But, if the physical welfare of those occupying schoolhouses for several hours each day was not to be considered, the fact that a great saving is effected through automatic temperature control is still worthy of consideration. The practical school official is not mercenary and has a proper regard for the physical welfare of those in his charge.

Thus thousands upon thousands of school buildings are equipped with recognized systems of heat regulation rendering not only a service to the cause of education, but also playing an important part in the economies of school administration.

Paper read before the Congress of the American School Hygiene Association, Feburary, 1909, Chicago.

"WHAT AND HOW" IN THE KINDERGARTEN.

Among educational books recently published it is difficult to find a more remarkable volume than *"What and How,"* brought out by Milton Bradley Company. And it is, perhaps, quite in keeping with the eternal fitness of things that so unusual a book should have an out-of-the-ordinary beginning.

It had been the intention of the publishers to produce the book in San Francisco under direct supervision of the authors. The plates were all made and the work of publication about to begin when the San Francisco earthquake came along and destroyed not only engravings, but original drawings, and practically all of the work that author, engraver and printer had put into the book. The authors then duplicated the drawings, color designs and text, and more plates were made. But a new difficulty arose. With the manuscript ready for the press, no concern could be found in San Francisco or vicinity which would undertake the contract to print so pretentious a work, their facilities having been, too, recently reduced by the 'quake to permit of handling so large a proposition. The plates were therefore shipped across the country to Springfield, Mass., where the book was finally produced.

Other interesting features of the book, mechanically, are that it is printed on the heaviest coated paper made, that every sheet was run through the press forty-two times, and that some pages are printed in twenty-one different colors. It is one of the most elaborate volumes of color work ever produced in educational books.

NEW BOOKS.

Education by Plays and Games.

By George Ellsworth Johnson, superintendent of play-ground, recreation parks and vacation schools, Pittsburg, Pa. 234 pages. Ginn & Company, Boston, New York, Chicago.

One winter evening a man and a woman stood watching the cheerful blaze in an open fireplace. They were talking lightly, yet with an undertone of seriousness of the real difference between work and play. Suddenly a little girl of ten exclaimed, "Why! papa, work is what we have to do, play is what we don't have to do." That child was better off than her elders. She thought she knew.

In this interesting and scholarly book is a discussion of the theory, history and place of play in education. It is conceded we must seek for the explanation of play in the study of evolution and that we shall know just what play is when we know just what evolution is. Still it is justly claimed that "play is concerned with everything; emotions, feelings, acts, thoughts, imaginings, speech—all begin their career under its subtle shaping influence." The theories and teachings of the ancient and of noted modern thinkers are clearly stated. Special mention is made of a remarkable book by Gute Muths, "Spiele zur Uebung und Erholung des Koerpers und des Geistes," which had a

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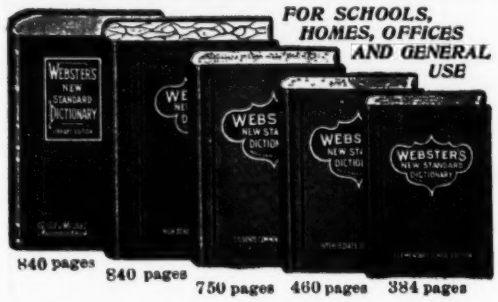

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remarkable influence upon the physical habits of the Germans. Honor due is rendered Pestalozzi and Froebel. The latter always laid stress upon allowing the child to be himself at each successive stage. In a general way modern research and child study can do little more than repeat this statement; but advances in physiology, biology and evolution have greatly enlarged our understanding of the significance of these stages.

Plays and games galore have been graded by age from infancy to the middle teens into five groups. From more than a thousand games the author selected the most representative and important. These were then studied to find what muscular activities, what mental qualities, what kinds of specific knowledge each would develop. It was noted that plays for young children cultivated the senses, accuracy in physical movements, imitation, interest in making collections, development of individuality—sometimes called selfishness. Later, a love for construction, interest in competitive and co-operative games becomes prominent. In the latter a sense of being one of a group, of being social, is gained. In large play-grounds the use of suitable games has not only raised the tone of the play-ground, but of the classroom. Why not? If the pleasure of using bodily and mental powers, the gladness of successful achievement, be wisely transferred from plays to well-arranged work children will know something all their lives of what Robert Browning terms "the wild joyousness of living."

Illustration upon illustration—photographs show children happily intent upon what they like to do and what it is good for them to be doing.

Selections from the Works of John Ruskin.

By Chauncey B. Tinker. 328 pages. Price, 50 cents, net, postpaid. Houghton-Mifflin Co., Boston.

Selections, not mere extracts, are to be found on these pages. In some cases, entire chapters or lectures have been given; in other cases only passages, but passages of sufficient length to ensure a correct notion of the context. "Modern Painters," "The Stories of Venice," "The Seven Lamps of Architecture," "Lectures on Art," have each furnished something choice and characteristic. The text is that of the first editions. The notes or references of the editor are marked by a fine discrimination.

Here one may read of the glory of the mountains—glory caused by masses of color—purple, violet and deep ultramarine blue—glory caused by the continual variety in species of flowers, by the presence and power of water, by changing and moving masses of clouds. Farther on a wonderfully vivid description of the surroundings, physical and religious, that indelibly colored the boyhood, then the life work of two painters, Giorgione and Turner. Farther on still one may read of the approach to St. Mark's, of the essential elements of Gothic architecture, and of much that inspires thought and high purpose.

Whatever the theme, there is always disapproval of merely mechanical work, always insistence upon fidelity to truth, always exhortation towards enlarging and uplifting the life of the worker of low degree. In many a strain and in many a key, John Ruskin always preached that "righteousness exalteth a nation."

The Summers Primer.
The Summers Manual.

By Maud Summers. Cloth. Illustrated. 113 pages each. Frank D. Beattys & Co., New York.

This series, consisting of primer, first reader, and a manual for first lessons in reading, has been prepared by a former principal of one of the large elementary schools in Chicago. In the primer the basis of the lessons is the activities in which children are naturally interested. Even the verbs are largely action words, while forms of "to be" are sparingly used. This is logical, as the concrete world is the child's first world. It has been left to others to struggle with the problem of successfully handling even primary abstract ideas. The value of the skillful use of the line appears in the numerous black and white illustrations which often suggest pen and ink sketches.

Modes of teaching reading to gain mastery of thought, gradual but steady teaching of phonics, are the main subjects in the manual. As all points are handled in an independent, scientific fashion, the book will be helpful with any series of readers.

Book of Homonyms.

By B. S. Barrett, Brooklyn. Octavo. Cloth. 192 pages. Price, 75 cents, net. Isaac Pitman & Sons, New York.

Every teacher of English knows the difficulty of teaching the correct use of homonyms with rules and definitions. This book presents nearly six hundred homophonous and homogeneous words and their definitions, and gives four complete exercises with each set to illustrate their use. These consist of a paragraph for dictation, a group of sentences to be described, examples of incorrect usage and a letter. Commercial classes in high schools and business schools will find the book most useful in both shorthand and language work.

The appendix contains rules for spelling, hyphenated and contracted words, divided words, punctuation, and other difficulties of language not usually treated in the ordinary grammar or rhetoric.

The book is of unusual merit and deserves wide use.

The Garden Game and Other Songs.

By Julia A. Hidden. 31 pages. Price, 75 cents. Milton Bradley Co., Springfield, Mass.

The absence of high notes, the large use of keys in flats, mark these melodies. The tender vocal chords of children will not be over strained while singing these attractive songs gathered from many sources.

English High Schools for Girls.

Their aims, organization and management. By Sara A. Burstall, M. A., head mistress of Manchester high school for girls. 243 pages. Longmans, Green & Co., New York.

A valuable book upon an important subject. For minuteness of detail, for dispassionate statement of opinion, for breadth of view, it would be hard to find its equal.

A brief historical survey notes that about 1848-50 there began in England a very remarkable movement for the better education of women. Between 1850 and 1875 some good secondary schools were founded, a special commission made a specific report upon the cardinal faults in the old system of education for girls, and the new movement was fairly launched. Some of the topics developed in these pages are: A good working number of pupils for one school, arrangement and equipment of buildings, organization, curricula, methods, discipline, tests and awards, care of health, personal relations of teachers to pupils, parents and the outside world. This partial enumeration seems searching in its thoroughness.

Stress is laid upon care of the health of growing girls. This is highly English; would that it were also highly American. Still, we in the United States, are learning of late that care and training of the body should go hand in hand with care and training of mind. Equal or even greater stress is laid upon the part played in a secondary school by the character, the personality of the teacher. In discussing courses of study, the question of training for practical results is not forgotten. The fact is faced that under present social and economic conditions, many women, married or unmarried, who have been brought up "to be taken care of," have been left destitute, struggling to become bread winners with all the odds against them.

A study of the policy of these schools produces a conviction "that a liberal education in school and preparation for service to the community when school is over" are their strong characteristics.

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The Educational Process.

By Arthur Cary Fleshman. 325 pages. Price, $1.25. J. B. Lippincott Company, Philadelphia.

This book, says the author, attempts to organize a new doctrine of education out of an old theory of thought. The peculiar method of treatment is original, but the fundamental principle creating and organizing the educational process is the central truth of all philosophy. The problems of education are explained as a spiritual process. Education is a spiritual activity rather than a brain activity. The school is "an organic spiritual unity," and not a material, objective, fixed thing. Teaching is not a mechanical process, but a spiritual activity beneath the form. Life itself is not wholly physical and physiological, but in the last analysis a spiritual process.

In constructing his doctrine of education the author does not claim originality in the philosophy embodied in the text. He claims to have followed closely the great thinkers of the world, ancient and modern, and their interpreters, and has incorporated into this text those ideas and systems of thinking bearing directly upon the central thought of this theory and practice of pedagogy.

In the editor's preface we read: "The person who evolves a theory of education, no matter how coherent, gives little sympathy and affords less guidance unless that theory is found to organize and make meaningful the vast sum of concrete data given by actual experience in terms of law and of philosophic guidance. The author has had an extended discipline both in the theory and in the practice of educational things, and presents in this volume his best thought as guidance for those who possess the hunger to know the meaning of every act of the teacher in terms of purpose and in formula of law."

The Young Citizen's Reader.

By Paul S. Reinsch, Prof. of Economics, The University of Wisconsin. Cloth. 258 pages. Price, 60 cents. Benj. H. Sanborn & Co., Boston, New York, Chicago.

This reader is in advance. The writer has made a portrayal of action in political life, showing men at work, struggling for influence and power and performing the duties of office and of citizenship. The prime purpose of the work is to train boys and girls to notice what is going on around them in their own town, state and nation. Of course, so large a theme cannot be adequately covered in a small reader, but an endeavor has been made to point out those things which are most vital and important, in order that they may acquire a meaning in the minds of young people which will help them in after life. The author does not claim that this reader is a handbook on American government but merely a firm introduction to that field. The work is divided into sections: The Government and the Citizen. What Governments Do, The Organization of the Government, Some American Ideals, viz., Hospitality to All People, Liberty, Equality of Opportunity, Patriotism, The Declaration of Independence; and finally an Analysis of the Federal Constitution.

A History of Education.

By Frank Pierrepont Graves, professor of history and philosophy of education in the Ohio State University. Cloth, 304 pages. Price, $1.10, net. The Macmillan Company, New York.

An interesting study of education before the middle ages and the existence of the monastic schools. The aim has been to present sufficient material to mark the most significant movements and disclose the underlying principles. The author has endeavored to point out the traditional forms of expression that have grown up among various people and become fixed by social habit, and the lack of progress that has ensued until, through some conflict of tradition, the individual is enabled to select a new pathway of expression.

In order to present the education of each period in its proper setting and show how its ideals arose, a brief account of its political and social history has first been given. Thus the book deals with Savage, or Nature People, Barbarism or Early Civilization, Egypt, Babylonia and Assyria, Phœnicia, China, India, Persia, and the character of the Earliest Civilization. With Israel and India is the beginning of individualism in education. Sparta and Athens, Rome and the Roman World, and finally Early Christianity are treated in separate chapters. The author claims that the work is no more than an introduction to the study of modern education, nevertheless an essential for a full understanding of present conditions.

Among Bookmen

BOOKMAN AS CORRESPONDENT.

"We are accustomed to consider topographical errors as annoyances. I had such an experience," said Mr. G. W. Hootman, the genial western agent of the Sadler-Rowe Company, recently.

"While in Texas several years ago I visited the quaint old city of San Antonio. I went to see the famous mission, the Alamo, and wrote a brief description of it to a home paper, calling special attention to its historical significance. I recalled the brave defense of our soldiers and how Gen. Santa Anna and his 5,000 Mexicans massacred all of them. I said: 'Thermopylae had her messenger of defeat; the Alamo had none,' for Santa Anna spared not one of the brave men who asked for quarter.

"Imagine my chagrin when my letter appeared in print to see that the well intentioned compositor made me say:

"'Thermopylae had her messenger of defeat; the Alamo had none, for Santa Anna spared not one of the brave men who asked for *a* quarter.'

"That error was embarrassing, you may imagine, and my friends had a good deal of fun at my expense. But it was not nearly so painful as a little incident in which I took part not long ago.

"I spent twenty years in the profession of teaching. During my travels for the ten years past I have met many of my former pupils. Of course many of them are now married and have families.

"Several months ago while on the train in Illinois I met one of my old pupils who had her little son James with her. The child was about four years of age and very talkative and also a very attractive scion.

"The child's mother was proud of him—told 'Jimmie' who I was, and our meeting was quite delightful in every way. To make Jimmie feel pleased I gave him a bright, new penny.

"His mamma said, 'Now, Jimmie, what do you say for that?'

"The boy had caught the spirit of the times, and instead of saying 'Thank you,' as he was expected to do, he stood erect, holding the penny, and loudly exclaimed, 'I say I want a *nickel.*'"

AMONG BOOKMEN.

Mr. O. J. Laylander has been admitted to membership in the firm of Ginn & Company. Mr. Laylander will continue as manager of the public school department at Chicago with an increased salary. After retiring from the Cedar Falls schools in 1900, he had charge of eastern Iowa for Ginn & Company until 1903, when he was called to Chicago to take charge of the common school department for the firm. He is the first western man to be admitted as a member of the firm.

Mr. Isaac B. Smith, who covered western New York state for Ginn & Company, resigned March 1st to take the same territory for Silver, Burdett & Company. He continues to reside in Syracuse.

The territory of Mr. Fred C. Williams of Silver, Burdett & Co. has been changed to relieve him of Colorado and to take the Dakotas. He makes his headquarters, as in the past, in Lincoln, Neb.

Dudley Redwood Cowles is the southern manager for D. C. Heath & Co., with headquarters at Atlanta, Ga. Mr. Cowles represents six states in the south. He was formerly connected with the firm's eastern office.

Casper W. Hodgson, who used to do book agency work on the Pacific coast, is now the manager of the World Book Co.

Nervousness

The use of **Horsford's Acid Phosphate** has been found exceedingly valuable in nervous disorders, restoring energy, increasing mental and physical endurance, and as a general tonic.

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Parts He Saw.

"Now, Tommy," said the visiting school director to the small boy who was supposed to know something about grammar, "what are the parts of speech?"

"The tongue, the lips and the throat," replied the bright child without hesitation.

What Is a Kiss?

A girl studying grammar in school was asked by the teacher if kiss was a common or a proper noun. After some hesitation she said:

"It is both common and proper, according to circumstances."

Was Not He Generous?

"Shame, sir!" exclaimed an indignant mother, on surprising the juvenile piano teacher in the act of kissing her daughter.

"Is it this I am paying your fees for?"

"By no means, madam," politely replied the young artist, "for I have never charged a cent for it."

Stripped.

College President—"You'll contribute to our endowment fund, of course?"

"Not this year," replied the insurance magnate. "You see, the only money I have at command now is my own."

Der Herr Professor.

„Aber Karl, bei diesem strömenden Regen spannst Du nicht einmal Deinen Schirm auf?„

„Ach so, ich dachte, ich hätte ihn vergessen."

THE PUBLIC SCHOOLS OF THIS

country are putting before the pupils more and more the examples of great and good men and women. The stories of the glorious deeds of noble men are not only the most interesting but one of the best methods of instructing the young.

The Dixon Company has just issued a 32-page booklet similar in style to their Pencil Geography. It gives about sixty brief accounts of a few of the men and women who have been identified with the early history of this country, and who attended what was then known as "The Little Red School House."

It contains information that will be valued by both teachers and pupils. Copies sent free to all teachers who desire them.

Joseph Dixon Crucible Company

JERSEY CITY, N. J.

Teacher—"What is steam?"

Johnny—"Steam is cold water gone crazy wid de heat."

"How do you write 'horn'?" asked the teacher of a small boy at the blackboard.

"A horn isn't written at all," answered the little fellow. "It's blowed."

"Who is the old file over there with the comic coat, the stovepipe hat and the baggy kneed trousers?"

"That's the professor who is lecturing on the absurdities of woman's dress."

Sunday School Teacher—The wisest man that ever lived said "There's nothing new under the sun."

Small Pupil—"Didn't they never have a baby at his house?"

Mother Goose Revised.

"The queen of hearts,
She made some tarts,
All on a summer's day.
The knave of hearts,
He stole the tarts,
And with them ran away.
The king of hearts,
He saw the theft,
And called ye knave a fool.
For well he wot
The tarts jack got
Were made at cooking school."

Professor in Chemistry—"Now, tell me briefly, or rather just give me the essence of your experiments with tartaric acid and carbonate of soda."

Young Chemist—"Certainly, sir; effervescence."

Qualified.

The girls were grouped in the playroom for a frolic.

"We'll play school," said Esther, "and I'll be the teacher. You sit in front of me and do just as I tell you."

"You can't be teacher," observed Mabel.

"Why can't I?"

"You can't, Esther King. Your hair is real and you ain't got no gold in your teeth."

"Teacher can't help that," replied Esther. "Perhaps she had an accident once and her frizzles and the gold help her out now. Anyhow, I can say 'pre-pon-der-ance' and 'per-spi-cu-i-ty' just like she can, and I'm going to teach."

This conclusively demonstrated her right to teach and she held the throne.—Mother's Magazine.

In the History Class.

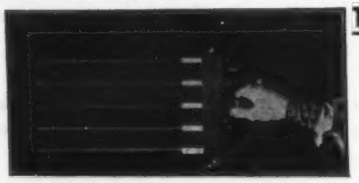
Professor J.—"Mr. Freshman, what do you know about the age of Queen Elizabeth?"

Freshman—"Well, sir, I think she was lots older than people knew."

An Easy Job.

She—"I don't think it would be wise for us to marry until you are re-appointed by the school board, do you?"

Schoolmaster—"I don't know; your father said he would pay me to keep out of his sight."



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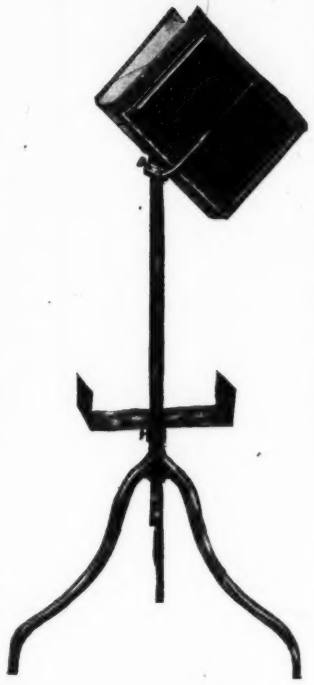

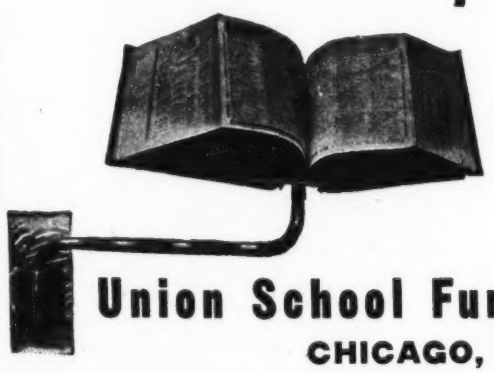

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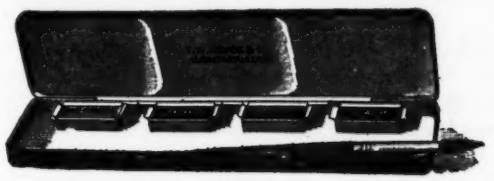

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Mr. Hammond Returns to Standard.

Mr. Herbert H. Hammond, for a number of years in charge of the Boston office of The Standard Electric Time Co., but for the past year with Dey Time Register Co., Endicott, N. Y., has recently resigned the latter connection to return to the old stand at 35 Congress street, Boston. He is again in charge of the sales of The Standard Electric Time Co.'s product for New England and along the New York Central lines west. The Dey Time Register Co. have concluded to abandon the secondary and program clock business and will turn over such inquiries as may come to them to the Standard Co., confining their efforts strictly to recording clocks.

Mr. Hammond is a veteran in the field of electric time systems, and by reason of his long experience and technical knowledge of every detail he can be of vast benefit to architects, engineers and school authorities in helping to determine their requirements and furnishing specifications for clock installations. This he will do cheerfully and without obligation on the part of those whom he may serve.

Mr. Hammond will be ably assisted by Mr. Carl P. Sweetser, who has been connected with the company for the past eight years.

MR. HERBERT H. HAMMOND,
Manager Standard Electric Time Co., Boston.

A VENTILATING SYSTEM FOR RURAL SCHOOLHOUSES.

(Concluded from Page 13)

out. No part of the apparatus is patented except the wind pump. This and a few pounds of metal and a few days' labor covers the cost of the apparatus. It is safe to say that the comfort and well-being of the little flock who gather round it will justify the scanty outlay. Good luck to a thousand schools who need the outfit.

Michigan School Boards to Meet.

School boards and superintendents in Michigan have been invited to attend the annual joint convention of school board members and superintendents in Lansing on April 22 and 23. Pending school legislation will furnish the chief topics of discussion. Among the questions to be treated are the following: Township school organization, agriculture in schools, technical and vocational training, the length of high school courses, and mental arithmetic. Supt. Charles W. Michens will preside over the superintendents, and Mr. Will H. Brunson will be chairman of the school board section.

HENRY BAUSCH DEAD.

Mr. Henry Bausch, vice-president of Bausch & Lomb Optical Co., and a leader in the development of American scientific optics, died on March 2 at Augusta, Ga. He had gone south from Rochester for a change of climate. Mr. Bausch was, at the time of his death, within a few weeks of being fifty years of age.

Mr. Bausch gave most of his attention in his business life to the scientific problems connected with the construction of lenses and other optical parts of scientific instruments, especially microscopes, a work for which he was thoroughly trained. He was the third son of J. J. Bausch and was born in Rochester. Passing through the public schools, he was in time graduated from the Rochester Free Academy, and later from Cornell University.

After his graduation, in 1875, Mr. Bausch entered the factory of Bausch & Lomb and began at the bottom, as had his father and brothers before him, to learn the business. He served his time as an apprentice, working at the bench like any other young man, but was soon advanced. His university training had been of a highly technical nature and fitted him for advanced work in the development of the microscope.

Mr. Bausch was active in matters pertaining to municipal improvement. He was a member of the Rochester park board for a number of years, and did much for the development of the park system of his native city. He was active in charitable and philanthropic movements, and was for many years a member of scientific organizations.

Modest and retiring in his disposition, Mr. Bausch was at the same time forceful and energetic and a valued citizen.

TUCKAHOE HIGH SCHOOL.

(PAGE 17.)

The new Tuckahoe high school, designed by Architect Clyde S. Adams, Philadelphia, Pa., is the first district high school in the state of New Jersey, and has been very highly commended by the state board.

The main floor contains ample corridor space, with a large classroom on the one side, laboratory, recitation room, wardrobe and large book closet on the other. Library space has been provided at the top of the stair landing.

Although the building is but one story and basement at present, provisions have been made at some future date to raise the building another story.

The building has been equipped with an approved system of hot air heating and ventilation. It is built entirely of brick with slate roof.

The cost of the entire structure was $6,400.

COMING CONVENTIONS.

April 8-10. Alabama Educational Association, at Birmingham. W. C. Griggs, secretary, Birmingham.

April 8-10. Southeastern Iowa Teachers' Association, at Iowa City. F. W. Else, Oskaloosa, president.

April 10. Association of Teachers of Mathematics in the Middle States and Maryland, at Syracuse, N. Y.

April 13, 14, 15. Ontario Educational Association, at Toronto, Canada.

April 16, 17. Southern Wisconsin Superintendents and Supervising Principals' Association, at Milwaukee. E. M. Beeman, president.

April 26-30. International Kindergarten Union, at Buffalo, N. Y.

April 22-23. Michigan City Superintendents' and School Board Association's joint meeting, at Lansing, Mich.

April 29-May 1. Mississippi Teachers' Association, at Natchez.

MARBLELOID SANITAS FIREPROOF FLOORING.

A new flooring which is especially adapted to the uses of school buildings has recently come to our attention. It is primarily a German product, in common use in that country and known as Marebleloid Sanitas Fire-proof Flooring. Being laid plastic upon new or old wood or concrete floors, this product not only presents a floor surface that is essentially sanitary but one which affords at relatively small cost an attractive and permanent flooring, durable and of fine texture.

The manufacturers of this flooring, the Marbleloid Company of New York, state that their product is being specified by leading school architects throughout the country. The board of education of New York City, having given the subject exhaustive investigation, is specifying Marbleloid-Sanitas for new school buildings and in renovation work upon old buildings as well, as a covering for wood floors, subbase, wainscot and stair treads.

It is absolutely fireproof, having been tested and passed by the Bureau of Buildings, Manhattan, as a fireproof material. Moreover, a wooden floor or wainscot covered with Marbleloid-Sanitas is rendered absolutely fireproof. This fact at once recommends its use in school buildings.

Aside from its fireproof quality, however, it is really adapted to such use by reason of its sanitary nature. As we have stated, it is a monolithic body offering no cracks nor joints for the accumulation of dirt or moisture. When a flooring is installed in connection with a wainscot or subbase the surface is continuous with sanitary angles. As may be supposed it is easily kept clean. We are informed, moreover, that when it is necessary to open the floor for any purpose it can be readily and neatly repaired.

In this connection another feature which brings it within the peculiar requirements of school work is its natural elasticity. Owing to this attribute, it is noiseless and pleasant to the tread, never producing the fatigue noticeable in cement, tile and other hard floors. It is not slippery nor is it cold to the feet.

We believe that Marbleoid-Sanitas fulfills a long felt want as a perfect flooring for school buildings. Together with its many points of adaptability, the fact that its cost is nominal, will, we predict, insure for this material an increased demand among our better equipped school buildings. The day of unsightly, unsafe and unsanitary school floors is passing.

ESTABLISH AMERICAN BRANCH.

Mr. Joseph Goder of Chicago has recently established an American Branch of the renowned school supply house of Mueller-Froebelhaus, Dresden.

The supplies of this firm are well known to school men in all parts of the world for their high scientific standard and their intrinsic educational value.

Of the latest achievements of the Company, in the line of zoological preparations, we mention their Combination or Double-Preparations, showing from one side the exterior of an animal, and from the other side the skeleton.

In the geological department the Relief-Globes, which are manufactured up to 52 inches diameter, and Relief-Maps, especially those of Prof. Dinges, are of interest to the profession. Dr. Dinges is now at work preparing new corrected reliefs of the Rocky Mountains. Pikes Peak, and the Colorado Springs region will be first published and thereafter the Yellowstone Park and the Northern Glaciers region.

The Kuhnert-Leipold Relief-like Maps, which are generally considered to be superior to any physical map now published, will shortly be issued in English text.

For the teaching of history the Baldamus Series is recommended. The immense size of the maps makes them valuable for large classes and enables the pupils in the rear seats to distinguish every detail.

The firm has made a specialty of supplying entire school museums and laboratories. Interesting literature and price lists will be cheerfully sent to any one interested, upon application to Joseph Goder, 80 Dearborn St., Chicago.

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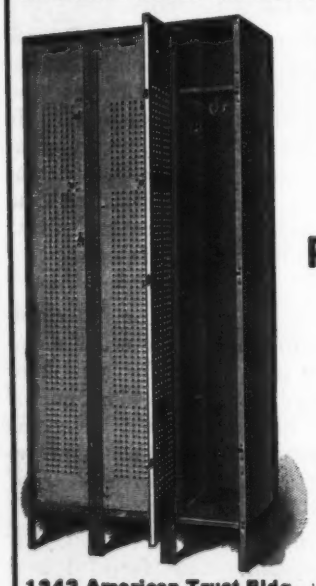

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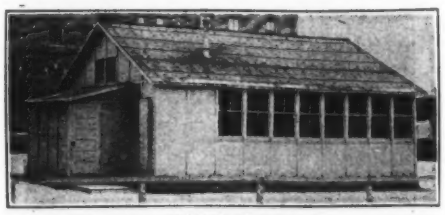

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DENVER CONVENTION ANNOUNCEMENT.

Dr. Irwin Shepard, secretary of the National Education Association, has issued a revised announcement concerning the arrangements for the Denver convention. It is the first time since the Boston convention in 1903 that the officers of the association have been able to announce at so early a date satisfactory railroad rates and ticket conditions.

The rates announced for all territory north of the Ohio and Potomac rivers, and also for the territory of the Western Passenger Association and the Transcontinental Association, are practically the same as for the Denver convention in 1895, when the rate was one-half fare on the basis of 3 cents per mile. The Trunk Line Passenger Association has authorized Mr. Shepard to announce that the rate from that territory will apply via St. Louis in one direction and Chicago in the other, or vice versa; thus giving the advantage of diverse routes. It is probable that this will also apply from points in the territory of the Central, New England and Eastern Canadian Association.

Arrangements are now under way for combining the rate for the Denver trip with a rate for continuing the trip after the convention to the Pacific coast, both to southern California, returning either via direct lines or via Portland and Seattle, and also direct via Salt Lake to Portland and Seattle, and returning either via northern lines or via California. These rates are quite certain to fall between $62.50 and $77.50 from Chicago, according to the route selected.

The Colorado lines are preparing to advertise extensively the various vacation resorts of Colorado and will grant half rates to all these points following the convention. All railroad lines seem disposed to afford every possible facility for making the trip to Denver pleasant and profitable for the teachers.

The program for the general sessions and the twenty departments are so nearly completed that the program bulletin will be issued early in April. In addition to the regular N. E. A. sessions, several other national organizations are arranging to hold sessions in Denver during convention week under the general auspices of the N. E. A., viz: The American Home Economic Society, the American School Peace League, the Society for the Scientific Study of Education, and several others whose plans are not completed.

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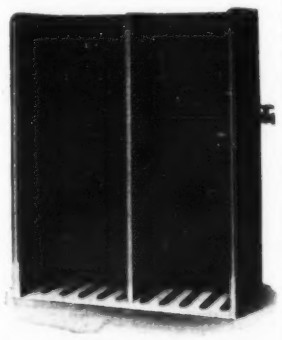
Slate is the only non-absorbent workable stone in existence which is adapted for all kinds of sanitary work and for structural purposes in the interior finish of buildings.

The popularity of natural slate blackboards has been largely due to the smooth writing surface they offer and to their lasting quality. A slate blackboard will not warp, crack or peel off. It cannot fade and does not absorb moisture or impurities. While artificial blackboards made from pulp are bound to disintegrate, the natural stone is imperishable.

The Keenan Structural Slate Company of Bangor, Pa., are specialists in the manufacture of slate blackboards and sanitary slate toilet inclosures. They also manufacture slate stair treads, platforms, etc.—in fact, everything in the structural slate line. They guarantee their genuine Bangor slate to be absolutely non-absorbent and of unequaled strength and durability. All of the sanitary fixtures which they manufacture comply with the underwriters' and sanitary codes.

Diagram showing proper method of setting Slate Blackboard.



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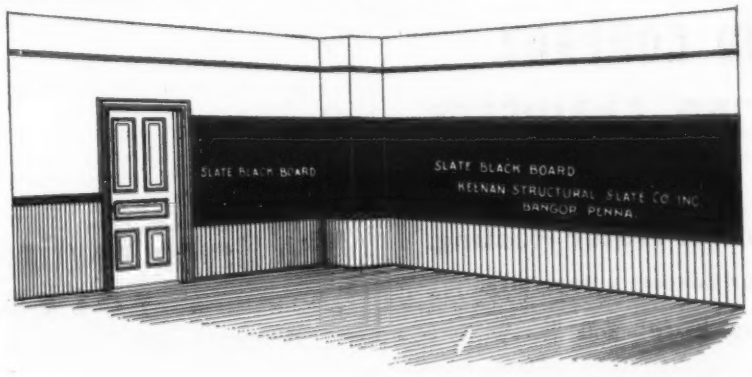
Co-operation with architects, engineers and others interested in sanitary slate is cordially offered by the staff experts of the firm. Full information, catalogues, etc., will be cheerfully sent on application.



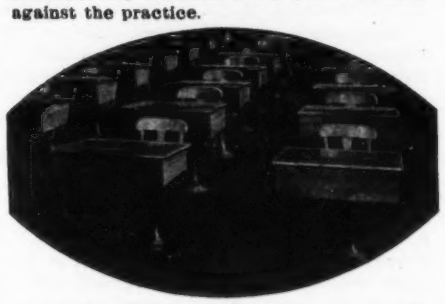
PREVENTION OF DISEASE CONTAGION AMONG SCHOOL CHILDREN

How it Can Be Accomplished

THE prevention of disease contagion among school children has long been a subject of serious study and exhaustive experimentation.

Medical Science has demonstrated that disease contagion is easily transmitted by *dust*, and that circulating dust, moreover, is the greatest carrier and distributer of disease germs known. The true remedy then—the true preventive of disease transmission—lies in the extermination of dust and its millions of living bacilli.

Dusty floors simply teem with these micro-organisms. Sweeping will not dispose of them. The action of the broom merely swishes the dust and germs into the air and affords an opportunity for them to circulate with every current of air. We must, then, regard dry-sweeping as particularly dangerous, and there should be a crusade in every school, every store, in every public building against the practice.



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Where Standard Floor Dressing is used the dust adheres to the floor and may be collected and disposed of without polluting the atmosphere, so that the dangers from dry-sweeping may be now entirely eliminated.

There are thousands of schools throughout the country using Standard Floor Dressing with remarkable success, and it is a fact that the health of many communities has been advanced by the use of this preparation on the floors of schools, stores and public buildings.

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To prove that our claims for Standard Floor Dressing are capable of actual demonstration, we are making an offer to officials in charge of public buildings and schools. We will treat the floor of one room or corridor *free of all cost*, so that you can personally see that the Standard Floor Dressing will most effectually keep down the dust and thus lessen the danger of contagion. To localities far removed from our agencies we will send free sample with full directions for applying.

We will be pleased to send particulars and our book, "Dust and its Dangers," to any address upon request.

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ALABAMA.

Red Bay—Archt. H. T. McGee, Jackson, Tenn., has plans for school. Montgomery—Archt. Frank Lockwood will prepare plans for high school.

ARKANSAS.

Altus—School will be rebuilt. Caddo Gap—Two-story school will be erected. Charleston—Propose erection of school to cost $4,000.

CALIFORNIA.

Bakersfield—School will be erected Lone Tree school district. Hanford—Plans have been accepted for Union high school; $25,000. San Diego—$45,000, bonds, will be voted for school. Los Angeles—Archt. F. P. Burnham will prepare plans for technical school; $80,000. Ten-room school will be erected; $7,600.

COLORADO.

Colorado Springs—Propose erection of high school and two or more grade buildings. Eaton—Archt. Vernon Redding, Boulder, has plans for 4-story high school; $30,000. Brush—Propose issuance of $25,000, bonds, for school. Greeley—Propose erection of high school. Lamar—Propose erection of high school.

FLORIDA.

St. Petersburg—Archt. Ferdon has plans for school.

GEORGIA.

Thomson—Archts. Sayre & Baldwin, Anderson, S. C., have plans for 3-story school. Atlanta—Preparations are being made for erection of girls' school; $50,000. Mt. Vernon—The sum necessary for erection of school is almost secured.

IDAHO.

Moscow—Plans have been prepared for parochial school.

ILLINOIS.

Odell—Archt. R. A. Young, Pontiac, has plans for 2-story school. Springfield—Archt. Geo. H. Helmle has plans for 2-story school; $60,000. Gillespie—Archt. Paul Moratz, Bloomington, has plans for 2-story school; $15,000. Sheridan—Archts. Reeves & Baillie, Peoria, have plans for 4-room school. Arenzville—Bonds were voted for erection of school. Joliet—Parochial school will be erected on Landau Ave.

INDIANA.

Topeka—Contract was let for erection of school. Elkhart—Archts. Gault & Gault, Terre Haute, have plans for 2-story school. Fulton—Archt. John Kindig, Rochester, has plans for high school. Boonville—Archts. Harris & Shopbell, Evansville, have plans for 2-story school; $18,000. Stinesville—Archts. Nichols & Son, Bloomington, have plans for high school; $8,000. Dugger—Archt. R. A. Bradley, Indianapolis, has plans for 5-room school; $12,000. Argos—Archts. Griffith & Fair, Fort Wayne, have plans for 2-story school. Cutler—Archt. Layton Allen, Indianapolis, has plans for 2-story school; $20,000. Anderson—Propose issuance of bonds for erection of high school. Indianapolis—Parochial school will be erected. Terre Haute—Plans are being discussed for erection of north end high school to cost $16,000.

IOWA.

McCallsburg—Archt. O. H. Carpenter, Iowa City, has plans for 2-story school. Perry—Propose issuance of $32,000, bonds, for school house. Mason City—Archt. W. F. Keefe, Austin, Minn., has plans for 2-story school; $35,000. Davenport—Competitive plans will be received for grade school. Oakville—8-room school will be erected. Shenandoah—School will be erected; $8,000. Larchwood—$12,000, bonds, were voted for erection of school.

KANSAS.

Coffeyville—Archt. C. A. Henderson has plans for 12-room school; $35,000. Moline—Bids have been received for erection of school. Spearville—Archt. C. W. Squires, Emporia, has plans for 8-room school. Hazelton—Archt. Fred G. McCune, Wichita, has plans for 2-story school. Wathena—Archt. W. F. Gernandt, Fairbury, has plans for 2-story high school; $22,000. Junction City—School will be erected. Protection—School will be erected. Wichita—Propose to issue bonds for high school and three ward schools. Sylvia—8-room school will be built; $13,000.

KENTUCKY.

Hopkinsville—Archt. Jas. L. Long will prepare plans for twenty-five county schools. Owensboro—Archt. F. J. Schlotter, Evansville, Ind., will prepare plans for high school addition; $50,000. Henderson—Archts. Harris & Shopbell, Evansville, Ind., have plans for manual training high school; $40,000. Lebanon—Propose issuance of $30,000, bonds, for school. Ashland—Grade school will be erected.

LOUISIANA.

Covington—Bonds will be voted for erection of school. Eunice—Site has been secured for high school. Opelousas—Propose issuance of $60,000, bonds, for central high school. Stonewall—Contract was let for colored school. Shreveport—Bids will be advertised for high school.

MARYLAND.

Baltimore—Archt. O. G. Simonson will prepare plans for 3-story school.

MASSACHUSETTS.

Dartmouth—Model school will be erected at Faunce Corner; $7,000. Newton—Plans are being prepared for technical high school. Brimfield—The citizens favor erection of 4-room school.

MICHIGAN.

Cathro—School will be erected. Wakefield—Archt. Joseph Llewellyn, Chicago, Ill., has plans for 2-story school; $65,000. Saginaw—Archt. Clarence Cowles has plans for school; $50,000. Luther—Archts. Osgood & Osgood, Grand Rapids, have plans for school. Copemish—Plans have been prepared for school; $8,000. Houghton—Plans have been prepared for West Hancock primary school. Wayne—Archts. Malcomson & Higginsbotham, Detroit, have plans for 12-room school. Grandville—School will be erected. Brimley—6-room school will be erected; $10,000.

MINNESOTA.

Buhl—Archts. Radcliffe & Price, Duluth, have plans for 4-room school. St. Paul—Archts. Buechner & Orth have plans for high school, East side; $115,000. Archt. E. J. Donohue has plans for 3-story school, West side; $100,000. Walker—School will be erected; $35,000. Duluth—Archts. German & Lignell have plans for C. C. Salter school. Hibbing—Archt. F. D. Orff, Minneapolis, has plans for 2-story school; $30,000.

MISSISSIPPI.

Pontotoc—Archt. R. H. Hunt, Chattanooga, has plans for school. Biloxi—School will be erected for colored children.

MISSOURI.

St. Louis—Archts. Baker & Knell have plans for 4-story school; $100,000. Lancaster—School will be erected, New Zion district. Columbia—$80,000, bonds, were voted for erection of high school, and $17,000, bonds, for ward school. Liberty—Propose issuance of $50,000, bonds, for school. Moberly—Propose issuance of bonds for high school.

MONTANA.

Plains—Archt. J. H. Kennedy, Missoula, has plans for 2-story school; $20,000.

NEBRASKA.

Plainview—Archts. Eisentraut & Co., Sioux City, Iowa, have plans for erection of school; $20,000. Hebron—Archt. W. F. Gernandt, Fairbury, has plans for 2-story school. Swanton—Archt. W. F. Gernandt, Fairbury, has plans for 6-room school; $12,000. Gibbon—School will be erected.

NEVADA.

Pioche—6-room school will be erected. Nevada City—2-story school will be erected. Reno—Plans have been submitted for school house.

NEW JERSEY.

Atlantic City—Archt. J. R. Ogden has plans for 3-story school; $40,000. Englishtown—Archt. Warren Conover, New York, has plans for 2-story school: $15,000. Newark—Archt. Ernest F. Guilbert will prepare plans for high school; $650,000. Belmar—Archt. Wm. T. Towner, New York, will prepare plans for 2-story school; $60,000. High Bridge—Archt. Wm. T. Towner, New York, will prepare plans for 2-story school; $18,000. Montclair—Grammar school will be erected; $250,000. Millburn—Contemplate issuance of $20,000, bonds, for erection of school.

NEW YORK.

Crawford—School will be erected, district No. 8. Hornell—Plans are being received for school; $30,000. Fredonia—$15,000, bonds, were voted for 16-room school. Olean—Archt. E. E. Joralemon, Niagara Falls, will prepare plans for school; $60,000. Brooklyn—Archt. Elliott Lynch, Manhattan, has plans for 4-story school; $100,000. Buffalo—Archts. Green & Wicks have plans for preparatory school; $100,000. Peekskill—Archt. E. E. Joralemon, Niagara Falls, has plans for 2-story school; $150,000. Auburn—Archt. S. E. Hilger will prepare plans for school. Castile—School will be erected; $20,000. Buffalo—Archt. R. Clipston Sturgis, Boston, Mass., has plans for technical high school. Boonville—Propose erection of school.

NORTH DAKOTA.

Hettinger—Archt. Fremont Orff, Minneapolis, Minn., has plans for school.

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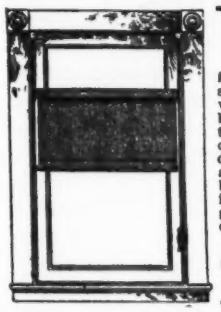

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St. John County Court House

ST. AUGUSTINE, FLA.

feyville, Kan., has plans for 2-story school; $50,000. Oklahoma City—3-story high school will be erected. Hugo—Archt. C. H. Page, Austin, has plans for three schools. Dill—Archt. T. J. Galbraith, Chickasha, has plans for 2-story school. Muskogee—Archts. Dawson, Kedian & Velure have plans for school. Woodward—Propose to buy site for high school. Hobart—Propose erection of high school. Shawnee—Site has been secured for high school; $85,000.

OREGON.

Dallas—School will be erected; $8,000. Eugene—Plans are being prepared for two schools.

PENNSYLVANIA.

Ridgway—Archt. H. C. Park has plans for 3-story school; $40,000. Cheswick—Archt. Paul W. Irwin, Pittsburg, has plans for 2-story school; $10,000. Pittsburg—Archt. F. J. Osterling will prepare plans for 2-story school; $55,000. Enola—Archts. Bernheisel & Son, Harrisburg, have plans for 2-story school; $12,000. Washington—Propose erection of high school. Boyertown—School will be erected. Lebanon—Propose erection of school to cost $8,000. Bentleyville—Propose erection of 8-room school.

RHODE ISLAND.

Providence—Archts. Hoppin & Field have plans for 2-story school; $60,000.

SOUTH CAROLINA.

Newberry—$40,000, bonds, will be issued for school.

SOUTH DAKOTA.

Willow Lake—Archt. A. H. Shoultz, Watertown, has plans for school. Woonsocket—Plans have been prepared for parochial school; $21,000. Yale—Archt. Geo. Issenhuth, Huron, has plans for 2-story school.

TENNESSEE.

Knoxville—Archts. Gredig & Lynn have plans for primary school; $10,000. Lenox—3-story high school will be erected; $27,800.

TEXAS.

Arlington—Archts. Hubbell & Greene, Dallas, have plans for 8-room school. Stanton—$15,000, bonds, will be voted for school. Wichita Falls—High school will be erected. Baird—Plans are being made for a central school building; $20,000. Rochelle—School will be erected. Odessa—$15,000, bonds, were voted for erection of school. Dublin—Propose erection of high school.

UTAH.

Salina—Archt. N. E. Liljenberg, Salt Lake City, has plans for 11-room school.

VIRGINIA.

Front Royal—Archt. H. C. Linthicum, Durham, has plans for school. Norfolk—Archts. Neff & Thompson were awarded the competition for the high school.

WASHINGTON.

Aberdeen—Archts. Russell & Rice have plans for high school; $125,000. Cliffs—Plans have been made for erection of school; $5,000. Milton—Archt. C. E. Finkenbinder has plans for 2-story central school; $20,000.

WEST VIRGINIA.

Martinsburg—Archt. J. W. Woltz, Waynesboro, Pa., has plans for school.

WISCONSIN.

Wayside—2-story school will be erected. Pulaski—Bonds were voted for 4-room school. Curtiss—2-room school will be erected. Loyal—Archts. Parkinson & Dockendorff, La Crosse, have plans for 2-story school. Grafton—School will be built. Kiel—Archts. Van Ryn & De Gellecke, Milwaukee, are preparing plans for high school; $15,000. Hustisford—School house will be built within a year.

CANADA.

Prince Albert, Sask.—School will be erected. Mt. Green, Sask.—School will be erected. Haileybury, Ont.—8-room school will be erected. Berlin, Ont.—Ward school will be built. Winnipeg, Man.—School will be erected. Little Plume, Alta.—School will be erected for Goose Lake district No. 1818.

OHIO.

Xenia—Archts. Samuel Hannaford & Son, Cincinnati, have plans for 2-story school; $20,000. Patterson—Archt. B. F. Matthews, Lima, has plans for school. Coshocton—Archts. Marriott & Allen, Columbus, have plans for 2-story school; $35,000. Delhi—Archt. Anthony Kunz, Jr., has plans for school. Norwood—School will be erected. Fredericktown—Archts. Howard, Inscho & Merriam, Columbus, have plans for 4-room school; $10,000. Barberton—Archts. Chas. Henry & Son, Akron, have plans for 4-room school. Columbus—Site was chosen for school on Champion Ave.; $65,000. Carbon Hill—Archt. B. F. Matthews, Lima, has plans for 4-room school. Farmer—Archt. R. A. Bradley, Indianapolis, Ind., has plans for 5-room school; $12,000. Mt. Vernon—Archt. F. S. Gleichauf, Columbus, has plans for 6-room school; $15,000. Delaware—Archt. C. Neff, Norfolk, Va., has plans for high school. Metamora—School will be erected; $24,000. Sharon—Site was purchased for 8-room school; $25,000.

OKLAHOMA.

Valliant—Archts. Glenn Bros., Hugo, have plans for 2-story school; $8,000. Weatherford—Archt. Chas. Sudhoelter, Muskogee, has plans for a main hall building, state normal school. Woodville—Archts. Tackett & Myall, Ardmore, have plans for 10-room school. Bigheart—Plans are being prepared for school. Lawton—Archts. Hair & Smith, Chickasha, have plans for high school; $75,000. Nowata—Archt. C. A. Henderson, Cof-

In October, 1908, the Government selected one of our standard Benches for the equipment of fourteen Government Schools in Alaska. We feel that we could hardly offer greater evidence of the exceptional merit and completeness embodied in our benches.

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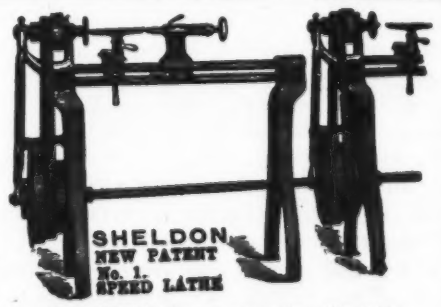

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from p. 19

follows the vocation of his parent naturally and without question. In this country it is the exception for the boy to pursue the father's trade.

Eleven years ago in a Massachusetts town, where I was superintendent of schools, I sent a questionnaire to 467 children between twelve and sixteen. One of the questions was, "What vocation do you expect to follow?" The purpose of the questionnaire was to get material for a talk to the young people of that community.

Less than a year ago I found that questionnaire among my "deadwood." I rescued it and succeeded in getting authentic information respecting the vocations of 406 of the original 467. Of the 406 five were following the vocations they had selected eleven years ago. I presume that throughout this country not over one per cent of children in the elementary grades will follow the vocations they might choose today.

Again the needs and natural development of the child must be considered. Children use the larger muscle groups earlier than those concerned in finely adjusted movements. To attempt the teaching of physical dexterity or trade to young children might result in a specialization of the smaller nerve and muscle centers long before their natural time of development and render the teaching ineffective.

The Course.

An important element in determining the character of our industrial education should be the demand of the industrial world. In all industrial pursuits the real demand is for efficient workmen capable of planning and inventing new designs and devices. The market value of a manufactured article is increased many fold by the slight variations in shape, texture, color or design which show the brain element of the true craftsman.

At the present time in the public schools of my city there is a very complete course in manual training for both boys and girls of the first nine grades. This work is directed by two supervisors and three supervising teachers. The aim of our course is not to teach a trade or special dexterity, but to teach the dexterities which underlie all manual pursuits. This is accomplished by teaching means of expression through the education of the hand in producing useful articles from coarse fibers, yarns, cardboard, wood, venetian iron, etc., and later by teaching the girls domestic science and art and the boys the proper use of fifty or more hand tools, requiring a high degree of muscular control, in making such useful articles as the pen-holder, hat-rack, bread-board, tabouret, etc.

This kind of work is the best industrial training for grammar grades in my opinion. It quickens ability in self-expression and power of individual initiative, and it leads up very naturally to the high school work, for girls, in advanced sewing and cooking, chemistry of foods, marketing, textiles, sanitation, heat, light, ventilation, fuel, laundering, hygiene, care of babies, general nursing, accounts and business forms, domestic architecture, gardening and general floral culture, etc.; for boys, cabinet-making, pattern-making, forging and metal work, machine-shop work, free-hand, architectural and mechanical drawing, electricity and steam, industrial chemistry, applied physics, heating, ventilation, sanitation, etc.

In this line of training are the essential elements of many trades which may easily be carried to a more complete development. One great advantage of this course is that it teaches the child to look ahead and to be more thoughtful; that results must be considered before action. Careful planning, exact measurements, accurate work impress upon him the importance and the habit of carefulness, patience and accuracy, and the moral lesson of truthfulness and justice inspired by the perfect square, tight joints and perfectly matched parts cannot be overlooked. Since a defect may be readily observed by both pupil and teacher, deception cannot readily find a place. It is impossible to substitute sham for honest endeavor.

I sincerely hope that we shall keep our industrial forces on a high educational plane. They should bear the same relation to trade instruction that liberal academic work bears to professional study. If any line of work can be demonstrated to be of greater practical value in making our children better and more efficient men and women we will not be slow to adopt it.—Address.

Plaster Casts

FOR DRAWING AND MODELING:

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for

SCHOOLROOM DECORATION

These Art Productions have never failed to receive the highest award when placed in competition with other makes.

C. Hennecke Co.
Formators.
Milwaukee, - Wis.

Send for Catalogue

UPPER LIGHT IN SCHOOLS.

A prominent school architect, writing on the lighting of schools, says: "Among the most important and beneficial advantages in modern school buildings is in securing better *light and ventilation*, thus providing for the saving of the *eyesight and health* of children, in the time of their life most needed."

The Johnson window shade adjusters, manufactured by R. R. Johnson of Chicago, have been used in a great many school buildings, and greatly appreciated by the above advantages.

The school boards in the cities mentioned have recently adopted them: Danville, Ill.; Middlesboro, Ky.; Augusta, Ga.; Lansford, N. D.; Lovington, Ill.; Stambaugh, Mich.; Uniontown, Pa.

Institute of Oratory and Expression.

An announcement of widespread interest to educational circles is that of the Frederick Warde Institute of Oratory and Expression to be conducted by the great Shakespearean actor, lecturer and educator, on his place, Wardesden, North White Lake, New York, during the months of June, July and August.

A sylvan theater and recitation hall is now under construction on the wooded shores of this beautiful lake for the use of the school. Special instructors of national reputation will assist Mr. Warde in the work of the institution. The aim throughout will be to make the courses of real practical everyday value to the teacher, the clergyman, the lawyer and to men of affairs in every walk of life.

The opportunity here afforded to combine the most delightful of summer vacations with thoroughly practical instruction in public speaking and expression is one to be seized with eagerness by all who can in any possible way take advantage of it. It will make a summer ideally enjoyable and profitable. Many have already registered for the course and inquiries are coming in from every hand for information.

Inquiries should be directed to E. A. Stavrum, Manager, Inc., Steinway Hall, Chicago, exclusive agents for the Frederick Warde Institute. A beautifully illustrated booklet giving full details will be sent on application to the above.

PLAYGROUND CONGRESS AT PITTSBURG.

The third annual playground congress will be held in Pittsburg, Pa., on May 11 to 14. The local committee on arrangements, the program committee and the committees on special subjects are busy at work preparing a strong program and an extensive series of novel exhibits and festivals for congress week. Carnegie Music Hall, one of the most beautiful and convenient places for gatherings in the United States, has been secured for the use of the congress.

The exhibition features will be particularly emphasized. Winter work and activities will be shown as of interest in the present movement for the all-year work of playgrounds. Another exhibition will deal with dramatics, folk dancing and games, while the value of music in playground work will be developed at a musical feature in which playground children will sing Italian, Russian, German, Irish and negro folk songs. Folk dancing also will be a special feature of the festival work.

The Pittsburg congress, moreover, will offer an excellent opportunity to study at first hand the way in which a municipality and a private organization can co-operate successfully, for the city of Pittsburg has placed the management of its playgrounds in the hands of the Playground association.

The general meetings will be held in the evening. The present plan is to have fewer addresses and to place greater emphasis on exhibition features. The speakers will be men and women recognized nationally as having an important message to offer on the play question and significant data to contribute to the working out of the great educational, physiological and civic problems, the solution of which is believed to lie in the field of properly conducted playgrounds. The topics at the general meetings will be limited to fields which have a truly national application. The detailed discussion of questions applicable to limited fields will be held in connection with the special conferences and committee sessions.

Full information concerning the congress may be obtained from President Luther Halsey Gulick, 1 Madison avenue, New York City.

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PUBLIC & HIGH SCHOOLS, COMMERCIAL SCHOOLS, & COLLEGES.
ALL LITHOGRAPHED, OR LITHOGRAPHED WITH BLANK SPACES FOR SCHOOL
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CHICAGO.

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and No. 284 INSPECTOR

EVERY TEACHER PRAISES THEM.

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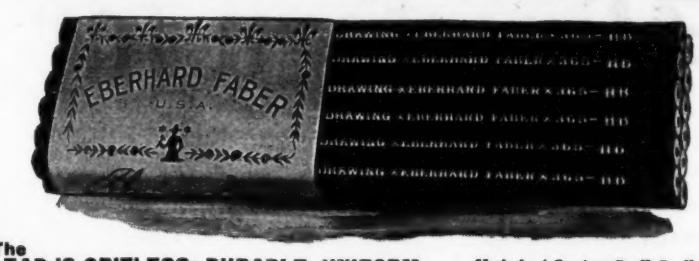
377-379 Broadway NEW YORK

Mention this publication

THE PERFECT SCHOOL PENCIL No. 366 Drawing



The LEAD IS GRITLESS; DURABLE; UNIFORM. Made in 4 Grades: B., H.B., H., H.H.

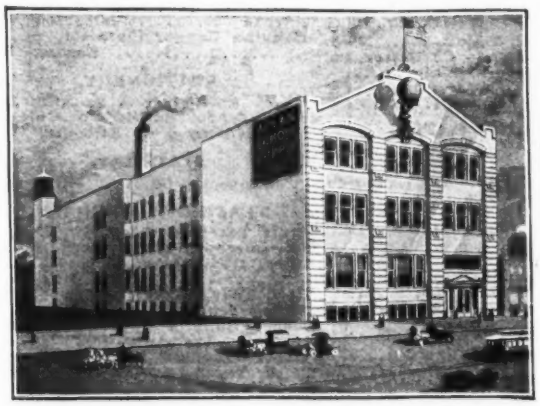
EBERHARD FABER NEW YORK

ATLAS BUILD FACTORY.

The Atlas School Supply Co., of Chicago, have just completed the erection of their new factory building containing 36,000 square feet of space, which is to be devoted exclusively to the manufacture and production of school supplies.

The building is a modern structure and is equipped with the very latest machinery for manufacturing school materials. Special attention has also been given to have every convenience for handling and shipping goods with dispatch.

It is the intention of the company to retain their general offices at their old address,



New Factory of the Atlas School Supply Co.

315-321 Wabash Ave., which is in the heart of the publishing and school supply district of the city.

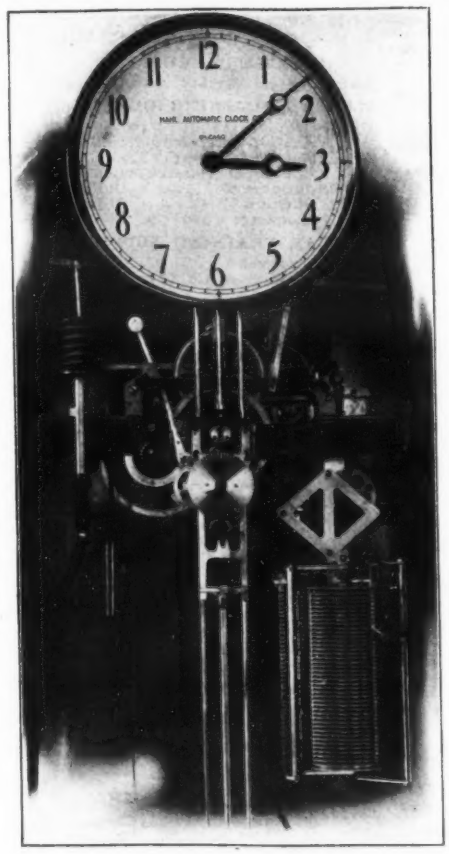
The Atlas School Supply Company has been in business a little over four years, having succeeded the Central School Supply House. The rapid growth of the company is due to careful attention to the needs of their patrons, also to a consistent policy of manufacturing and handling nothing but first-class goods.

The officers of the company are Irving R. Rehm, president and treasurer, and Fred E. Cardy, secretary.

THE HAHL PNEUMATIC-AUTOMATIC CLOCK.

"Inculcate the necessity and value of punctuality into the minds of the young."

The distinctive feature of the Hahl program clock is that it is operated by free atmospheric pressure and gravity. The motive power is, therefore, absolutely positive and the cost of operation practically nothing. The mechanism consists of a master clock of astronomical accuracy, equipped with a self-compensating pendulum beating seconds, propelled by a spring automatically wound every minute. The impulses of air are carried to all secondary clocks from the master clock through small iron tubing and are controlled by two valves operated ahead of the operation of the motor train of the master clock. The valves are opened to the air every alternate minute, thus compensating for any abnormal conditions of the atmosphere or possible leaks in the tubing.



Hahl Automatic Clock and Program Apparatus.

A prominent feature of these clocks is the program attachment which is *attached to* the *master clock* and is operated and regulated automatically by it. The attachment is very simple and readily accessible at all times, so that changes in signals may be made at any time. The low cost of installation and practically no-cost of operation commend this system, as well as its freedom from interruption of service; for the iron pipes used for conducting the impulses are practically indestructible.

Among the schools which have recently been equipped with these clocks are the Lane Manual Training school, Chicago; New High School (see pages 6-7), Madison, Wis.; Manual Training High School, St. Louis, Mo., as well as the new state capitol, Madison, Wis.; Ginn & Co.'s new building, Chicago, and the Cook county courthouse, Chicago.

At the new factory of the Hahl Co., located near the Maplewood station of the C. & N. W. Ry. in Chicago, every part of the clock is made with the exception of the wood cases. Prompt shipment of orders is, therefore, assured. The fulfillment of orders requiring special features to meet exact requirements is readily guaranteed.

Wisconsin Rural School.

The Wisconsin model rural school shown on page 17 is a solid brick structure with field stone basement and trimmings. It is similar in basement arrangement and interior finish to the frame and cement plaster building described last month.

The foundation wall is twenty inches thick and the upper wall is 12 inches, faced on the outside with colored brick, and striped on the inside with one-by-two-inch wood strips, lathed and plastered. The roof is of shingles stained moss green. The porch floor and steps are cement.

The classroom is 21x32 feet in size, wainscoted four feet high with brick. The wardrobe has a five-foot wainscot, surmounted by a shelf for lunch baskets.

The basement contains a hot air furnace and a Kewanee water tank and pump. Complete, the building may be erected in Wisconsin for $3,000. Without a basement it should not exceed $2,000.

High School Graduating Exercises

Are rendered Attractive and Impressive by the use of

CAPS and GOWNS

An economical uniform, saving time and money at a busy season; democratic in its unifying effect and appropriate in its academic significance. A trial will convince you of its practical value to your school.

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HISTORICAL MAPS

The set of Eight Historical Maps is constituted as follows:—

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5 Civil War, Spanish-Am. War, War in the Philippines
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7 Administrations and Political Parties
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THE McCONNELL SCHOOL SUPPLY CO.

4430 Market Street, Philadelphia, Pa.

Directory for School Supplies

The names given below are those of the leading and most reliable School Supply Houses in the United States. None other can receive a place in this Directory. Everything required in or about a school house may be secured promptly and at the lowest market price by ordering from these Firms.

APPARATUS—GENERAL.

Eimer & Amend.....N. Y.
American Seating Co.N.Y. & Ch'go
McConnell Sch. Sup. Co.....Phila.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
Jos. Goder.....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Whitaker & Ray Co.San Francisco

APPARATUS—SCIENTIFIC.

McAllister, Dept. 15....New York
Eimer & Amend.....N. Y.
Columbia School Supply Co....
.....Indianapolis, Ind.
C. H. Stoelping & Co....Chicago
McIntosh Stereopticon Co..Chicago
Jos. Goder.....Chicago

ARCHITECTS—SCHOOL.

G. W. Ashby.....Chicago

BELLS—MANUFACTURERS.

Meneely & Co..Watervliet, N. Y.
E. W. Van Duzen Co..Cincinnati
St. Louis Bell Fdry.St. Louis, Mo.

BELLS—DEALERS.

McConnell Sch. Sup. Co....Phila.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
Orr & Lockett Hdw. Co..Chicago
L. A. Murray & Co.Kilbourn, Wis.

BLACKBOARDS—COMPOSITION

Eastern Seating Co.Albany, N. Y.
N. Y. Silicate Book Slate Co.N.Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
Union School Furnishing Co....
.....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Whitaker & Ray Co.San Francisco

BLACKBOARDS—NATURAL SLATE.

E. J. Johnson & Co.....N. Y.
Penna. Structural Slate Co....
.....Worth Bldg., Easton, Pa.
Keenan Structural Slate Co....
.....Bangor, Pa.
Main-Bangor Slate Co.Bangor, Pa.

(Dealers.)

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Haney School Furn. Co.....
.....'Grand Rapids, Mich.
Columbia Sch. Supply Co.....
..... Indianapolis, Ind.
E. W. A. Rowles.....Chicago
L. A. Murray & Co.Kilbourn, Wis.

BLINDS.

E. W. A. Rowles.....Chicago
L. A. Murray & Co.Kilbourn, Wis.

BOOK COVERS.

Holden Book Cover Co.....
..... Springfield, Mass.
Natl. Book Cover Co.....
.....Syracuse, N. Y.

BRUSHES—DUSTLESS.

Milwaukee Dustless Brush Co..
..... Milwaukee, Wis.

BRUSHES—FLOOR.

Orr & Lockett Hdw. Co..Chicago

CAPS AND GOWNS.

Cotrell & Leonard.Syracuse, N. Y.

CHARTS.

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
Milton-Bradley Co....Springfield
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
E. W. A. Rowles.....Chicago
Atlas School Supply Co...Chicago
Rand, McNally & Co.....Chicago
A. J. Nystrom.....Chicago
Jos. Goder .....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Whitaker & Ray Co.San Francisco

CLOCKS—PROGRAM.

Fred Fricke Clock Co.....
.....Waynesboro, Pa.
Standard Electric Time Co.Boston
Hahl Automatic Clock Co.Chicago
R. W. Paltridge & Co....Chicago

CRAYONS—DUSTLESS.

American Crayon Co.Sandusky, O.
Standard Crayon Mfg. Co.....
..... Danvers, Mass.

(Dealers.)

N. Y. Silicate Book Slate Co.N.Y.
Eagle Pencil Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
M. H. E. Beckley.....Chicago
Atlas School Supply Co...Chicago
L. A. Murray & Co.Kilbourn, Wis.
Moore Mfg. Co...Springfield, Mo.

CRAYONS—WATER COLOR.

Am. Crayon Co.....Sandusky, O.
Prang Ed. Co.....N. Y., Chicago

DEAFENING QUILT.

Samuel Cabot .....Boston

DIPLOMAS.

Ames & Rollinson Co...New York

DRAWING SUPPLIES.

Eagle Pencil Co.....N. Y.
Jos. Dixon Crucible Co.....
.....Jersey City, N. J.
Milton Bradley Co.....
..... Springfield, Mass.
Standard Crayon Mfg. Co.....
..... Danvers, Mass.
Columbia School Supply Co.....
.....Indianapolis, Ind.
Prang Ed. Co.....N. Y., Chicago
E. W. A. Rowles.....Chicago
Devoe, Dept. 5....N. Y., Chicago

DRINKING FOUNTAINS.

Federal-Huber Co.....Chicago
L. Wolff Mfg. Co.....Chicago
Jas. B. Clow & Sons.....Chicago
N. O. Nelson Mfg. Co....St. Louis

ELECTRIC TOWER AND SECONDARY CLOCKS.

Harleigh Gillette.....Chicago

ERASERS.

N. Y. Silicate Book Slate Co.N.Y.
Eagle Pencil Co.....N. Y.
Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
M. H. E. Beckley.....Chicago
Atlas School Supply Co..Chicago
L. A. Murray & Co.Kilbourn, Wis.
Moore Mfg. Co..'Springfield. Mo.
Whitaker & Ray Co.San Francisco

FLAGS AND BUNTING.

Peckham, Little & Co.....N. Y.
Haney School Furn Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
Atlas School Supply Co...Chicago
L. A. Murray & Co.Kilbourn, Wis.

FLOORING.

The Marbleloid Co.....New York

FLOOR DEAFENING.

Samuel Cabot .....Boston

FLOOR DRESSING.

Standard Oil Co.....All Cities

GLOBES.

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
M. H. E. Beckley.....Chicago
Atlas School Supply Co..Chicago
Garden City Edu. Co.....Chicago
Union School Furn Co....Chicago
Moore Mfg. Co....Springfield, Mo.
Rand, McNally & Co.....Chicago
A. J. Nystrom.....Chicago
Jos. Goder .....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Whitaker & Ray Co.San Francisco

HEATING AND VENTILATING ENGINEERS.

Bryce Heating & Ventilating Co.
.....Toledo, O.
Columbus Htg. & Vtg. Co.....
.....Columbus, O.
Lewis & Kitchen.....Chicago

INK POWDERS.

George Mfg. Co.....Chicago

INK WELLS.

Squires Ink Well Co.Pittsburg, Pa.
U. S. Inkwell Co...Des Moines,
.....Ia., and Evansville, Ind.
E. W. A. Rowles.....Chicago

KINDERGARTEN SUPPLIES.

Milton-Bradley Co.....Springfield
E. W. A. Rowles.....Chicago
Thomas Charles Co.....Chicago

LABORATORY FURNITURE.

Eimer & Amend.....N. Y.
Columbia School Supply Co.....
.....Indianapolis, Ind.

LANTERN SLIDES.

McAllister, Dept. 15....New York
McIntosh Stereopticon Co., Dept.
3 ..... Chicago
C. H. Stoelting & Co.....Chicago

LIQUID SLATING.

N. Y. Silicate Book Slate Co.N.Y.
McConnell Sch. Supply Co..Phila.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
L. A. Murray & Co.Kilbourn, Wis.

LOCKERS—METAL.

Durand Steel Locker Co..Chicago

MANUAL TRAINING BENCHES.

Grand Rapids Hand Screw Co..
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
C. Christiansen .....Chicago
E. H. Sheldon & Co.....Chicago
Orr & Lockett Hdw. Co..Chicago

MANUAL TRAINING SUPPLIES.

C. Christiansen .....Chicago
E. H. Sheldon & Co.....Chicago
M. H. E. Beckley.....Chicago
Orr & Lockett Hdw. Co..Chicago
Machinists' Supply Co....Chicago
Moore Mfg. Co...Springfield, Mo.
Grand Rapids Hand Screw Co..
.....Grand Rapids, Mich

MAPS.

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Columbia School Supply Co.....
.....Indianapolis, Ind.
E. W. A. Rowles.....Chicago
M. H. E. Beckley.....Chicago
Atlas School Supply Co...Chicago
Rand, McNally & Co.....Chicago
A. J. Nystrom.....Chicago
Jos. Goder .....Chicago
Union School Furn Co....Chicago
Moore Mfg. Co...Springfield, Mo.

OPERA CHAIRS.

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
Geo. Barcus & Co..Wabash, Ind.
Milner Seat. Co, Box 945.....
.....Canal Dover, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
E. W. A. Rowles.....Chicago
M. H. E. Beckley.....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Moore Mfg. Co....Springfield, Mo.

PENCIL MANUFACTURERS.

Jos. Dixon Crucible Co.....
.....Jersey City, N. J.
Eagle Pencil Co.....N. Y. City
Eberhard Faber.....N. Y. City

PENCIL SHARPENERS.

F. H. Cook & Co.Leominster, Mass.
N. Y. Silicate Book Slate Co.N.Y.
Peckham, Little & Co.....N. Y.
Eberhard Faber.....N. Y. City
Jos. Dixon Crucible Co.....
.....Jersey City, N. J.
E. W. A. Rowles.....Chicago
L. A. Murray & Co.Kilbourn, Wis.

PEN MANUFACTURERS.

Eagle Pencil Co.....N. Y.
Esterbrook Steel Pen Mfg..CoN.Y.

PHYSICAL AND CHEMICAL APPARATUS.

Eimer & Amend.....N. Y.
Columbia School Supply Co....
..... Indianapolis, Ind.
C. H. Stoelting & Co.....Chicago
Wm. Gaertner & Co.....Chicago

PLASTER CASTS.

C. Hennecke Co..Milwaukee, Wis.

PLUMBING FIXTURES—SCHOOL.

Columbus Htg. & Vtg. Co.....
.....Columbus, O.
N. O. Nelson Mfg. Co.....
....St. Louis, Edwardsville, Ill.
Lewis & Kitchen.....
.....Chicago and Kansas City
L. Wolff Mfg. Co.....Chicago
Federal-Huber Co.....Chicago
Jas. B. Clow & Sons.....Chicago

PORTABLE SCHOOLHOUSES.

American Portable House Co...
..... Seattle, Wash.

PROJECTION LANTERNS AND SCREENS.

McAllister, Dept. 15....New York
C. H. Stoelting & Co.....Chicago
Wm. Gaertner & Co.....Chicago
McIntosh Stereopticon Co.....
.....Dept. 3, Chicago

PROGRAM CLOCKS.

(See: Clocks—Program)

RELIEF GLOBES.

Jos. Goder.....Chicago
McConnell Sch. Supply Co..Phila.
M. H. E. Beckley.....Chicago
Moore Mfg. Co...Springfield, Mo.
L. A. Murray & Co.Kilbourn, Wis.

ROOFING SLATE.

E. J. Johnson & Co.....N. Y.
Penn. Struct. Slate Co.Easton, Pa.
Keenan Structural Slate Co....
..... Bangor, Pa.
Main-Bangor Slate Co.Bangor, Pa.

RELIEF MAPS.

Jos. Goder.....Chicago
Atlas School Supply Co..Chicago
Rand, McNally & Co.....Chicago

SANITARY ENGINEERS.

Bryce Heating & Ventilating Co.
.....Toledo, O.
Columbus Htg. & Vtg. Co.....
.....Columbus, O.
Lewis & Kitchen.....
.....Chicago, Kansas City

SANITARY FIXTURES.

Keenan Structural Slate Co.....
..... Bangor, Pa.
Main-Bangor Slate Co.Bangor, Pa.
Slatington-Bangor Slate Syndicate .....Slatington, Pa.
Genuine Bangor Slate Co.....
..... Easton, Pa.
N. O. Nelson Mfg. Co.....
Columbus Htg. & Vtg. Co.....
.....Columbus, O.
....St. Louis, Edwardsville, Ill.
Federal-Huber Co.....Chicago
L. Wolff Mfg. Co.....Chicago
Jas. B. Clow & Sons.....Chicago

SCHOOL BLANKS.

Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
McConnell Sch. Supply Co..Phila.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Britton Ptg. Co., Dept A.....
.....Cleveland, O.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
A. J. Nystrom.....Chicago
Union School Furn Co....Chicago
L. A. Murray & Co.Kilbourn, Wis.

SCHOOL FURNITURE.

W. A. Choate.....Albany, N. Y.
American Seat. Co..N.Y. & Ch'go
Ohio Rake Co.....Dayton, O.
Milner Seat. Co, Box 945.....
.....Canal Dover, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
M. H. E. Beckley.....Chicago
C. Christiansen.....Chicago
Union School Furn Co....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Moore Mfg. Co...Springfield, Mo
Whitaker & Ray Co.San Francisco

SCHOOL SUPPLIES.

Eimer & Amend.....N. Y.
N. Y. Silicate Book Slate Co.N.Y.
Peckham, Little & Co.....N. Y.
American Seat. Co..N.Y. & Ch'go
N. Y. Silicate Book Slate Co.N.Y.
Albany Tchrs.' Agcy.Albany, N. Y.
W. A. Choate.....Albany, N. Y.
Standard Crayon Mfg. Co.....
..... Danvers, Mass.
McConnell Sch. Supply Co..Phila.
Columbia School Supply Co....
..... Indianapolis, Ind.
Geo. Barcus & Co..Wabash, Ind.
Am. Crayon Co.....Sandusky, O.
Ohio Rake Co.....Dayton, O.
Ohio Valley Sch. Supply Co.....
.....Cincinnati, O.
Milner Seat. Co, Box 945.....
.....Canal Dover, O.
Haney School Furn. Co.....
.....Grand Rapids, Mich.
Grand Rapids Hand Screw Co..
.....Grand Rapids, Mich.
C. Christiansen .....Chicago
C. H. Stoelting & Co.....Chicago
E. W. A. Rowles.....Chicago
Prang Educational Co....Chicago
M. H. E. Beckley.....Chicago
Atlas School Supply Co..Chicago
Rand, McNally & Co.....Chicago
A. J. Nystrom & Co.....Chicago
Union Sch. Furn. Co.....Chicago
Jos. Goder .....Chicago
George Mfg. Co.....Chicago
L. A. Murray & Co.Kilbourn, Wis.
Moore Mfg. Co...Springfield Mo.
Whitaker & Ray Co.San Francisco

SEWAGE DISPOSAL.

N. O. Nelson Mfg. Co.....
....St. Louis, Edwardsville Ill
Lewis & Kitchen.....
.....Chicago, Kansas City Mo

SLATE—STRUCTURAL.

Slatington-Bangor Slate Syndicate .....Slatington, Pa
Genuine Bangor Slate Co.....
..... Easton, Pa

STATIONERY.

E. W. A. Rowles.....Chicago
Atlas School Supply Co..Chicago
L. A. Murray & Co.Kilbourn, Wis

STATUARY.

C. Hennecke Co.....Milwaukee

TEACHERS' AGENCIES.

Pratt Teachers' Agcy..N. Y. City
Schermerhorn Tchrs' Agcy..N. Y.
Interstate Tchr's Agcy.....
.....Rochester, N. Y
Reed Tchr's Agcy.Syracuse, N. Y.
Albany Tchr's Agcy...Albany, N.Y.
School Bulletin Agcy....Syracuse
Central Tchrs' Agcy.Columbus, O.
Albert Teachers' Agency..Chicago
Clark Teachers' Agency..Chicago
McCullough Tchrs' Agcy.Chicago
Fisk Teachers' Agency.....Chicago
Thurston Teachers' Agcy.Chicago
Music Teachers' Ex.....Chicago
State Tchrs.' Agcy & Lyceum Bureau .....Indianapolis
Interstate Tchr's Agcy.....
.....New Orleans, La.
Parker Edu Bureau..Madison, Wis.
Colorado Teachers' Agcy..Denver
Business Men's Clearing House
..... Denver

TYPEWRITERS.

Smith-Premier Typewriter Co..
.....Syracuse, N. Y
Victor Typewriter Co.....N. Y.

VACUUM CLEANERS.

American Air Cleaning Co.....
.....Milwaukee Wis.

WATER COLOR PAINTS.

Milton-Bradley Co.....Springfield
Am. Crayon Co.....Sandusky, O.
Prang Educational Co....Chicago
Devoe, Dept. 5....Chicago, N. Y.

WALL DEAFENING.

Samuel Cabot .....Boston

WARDROBES.

Durand Steel Locker Co..Chicago

WINDOW SHADE ADJUSTERS.

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